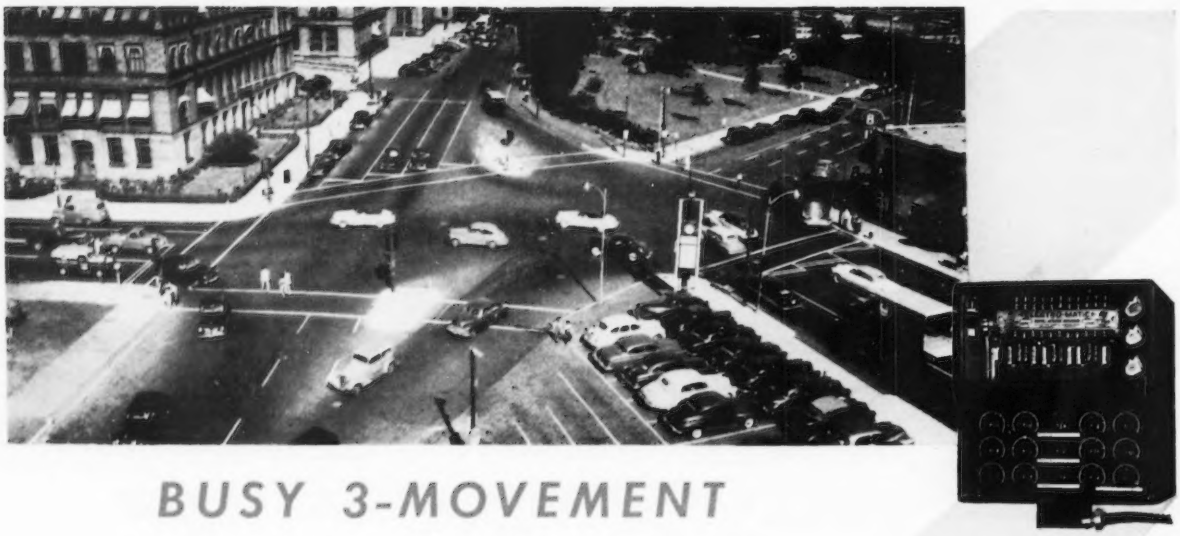
MARCH, 1954

Traffic Engineering

New Jersey Turnpike Improves Safety Record

- The Most Comprehensive Study Ever Undertaken
- Area of Influence of Lots and Garages
- Traffic Controls in the Vicinity of School Zones
- Strictly Business

Official Publication of the Institute of Traffic Engineers



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The following illustrates how right-of-way is transferred under varying conditions of traffic demand. Note that phases are skipped on which no traffic is present. Each phase has time extension and memory. A typical four-interval signal color sequence is used. G, Y, and R stand for green, yellow, and red signals.

(a) It is assumed that demand is present on each traffic phase. Note that the dispatcher includes each phase in the cycle.

Period :	1	2	3	4	5	6	1
Street A:	G	Y	R	R	R	R	G
Street B:	R	R	G	Y	R	R	R
Street C:	R	R	R	R	G	Y	R

(b) Here it is assumed that when the green light is ready to leave Phase A there is demand on Phase B, but when ready to leave Phase B, there is no demand on Phase C. Therefore Intervals 5 and 6 for Phase C are omitted from the cycle, and the green light skips to Phase A where there is a demand.

Period .	1	2	3	4	1
Street A:	G	Y	R	R	G
Street B:	R	R	G	Y	R
Street C:	R	R	R	R	R

(c) In this example, when the green light is ready to leave Phase A there is no demand on Phase B, so Intervals 3 and 4 for Phase B right-of-way are skipped, and the green light goes to Phase C in response to demand there. From Phase C it goes to Phase A where there is also demand.

Period :	1	2	5	6	1
Street A:	G	Y	R	R	G
Street B:	R	R	R	R	R
Street C:	R	R	G	Y	R

(d) The assumption here is that there is demand on Phases B and C, but temporarily no demand on Phase A.

Period :	3	4	5	6	1
Street A:	R	R	R	R	R
Street B:	G	Y	R	R	G
Street C:	R	R	G	Y	R

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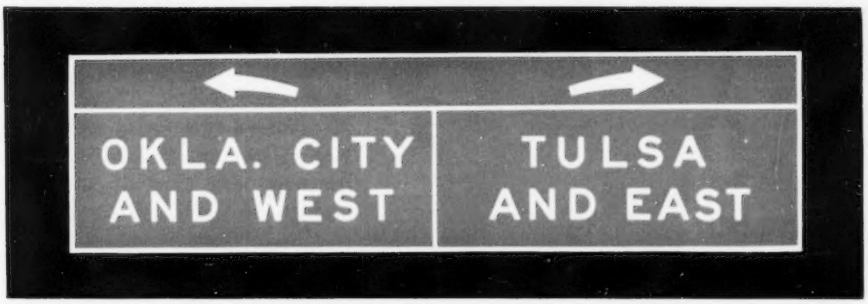

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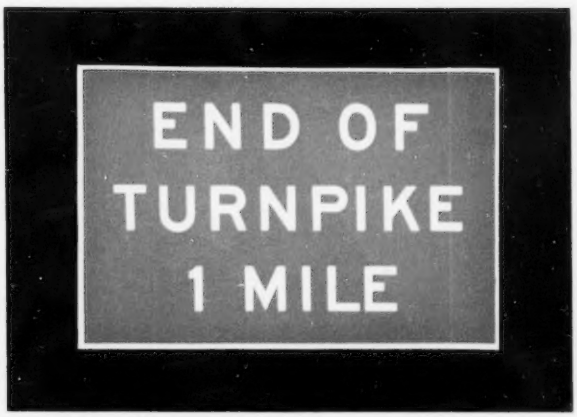

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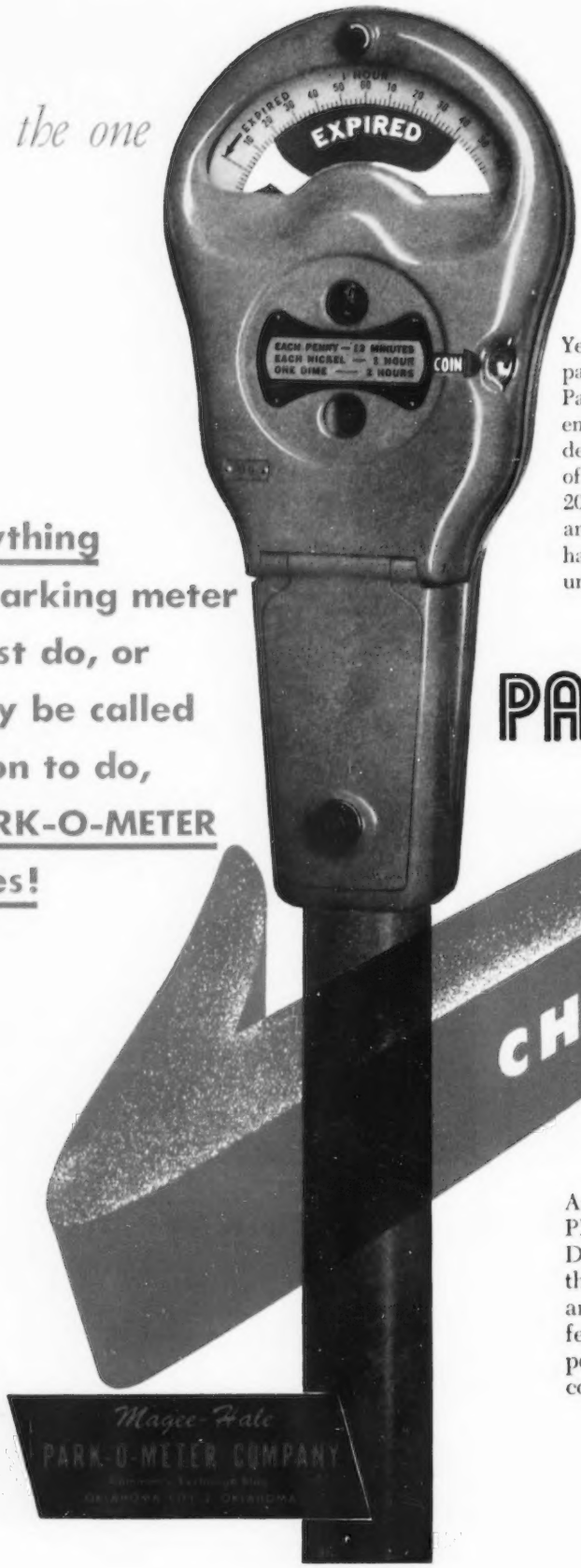

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Traffic Engineering

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

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COVER: This month's cover shows the special work of our art staff. The background photo is of the Passaic River Bridge looking south on the New Jersey Turnpike. The three inserts are pictures of the new emergency speed warning signs that have been installed on the Turnpike. Altogether there are 17 large neon-lighted signs on the Turnpike. They are erected at approximately five mile intervals in the northern end from the George Washington Bridge interchange to South Brunswick, New Jersey, a distance of 32 miles. They provide specific information as to emergency conditions ahead and have been extremely effective. A large message "Drive Slow" flashes on and off and alternate messages informing of "Accidents," "Snow and Ice" and "Fog" are used in combination with the word "Ahead." See the Traffic News section of this issue for a more thorough report of the Turnpike's fine safety achievements.

Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

May We Offer . . .

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Frankly Speaking

THE BEST LAID TRAFFIC PLANS of engineers frequently fail to produce anticipated results. A redesigned, channelized intersection may cause confusion and accidents. A multi-phased, signalized intersection, beautiful in simplicity to the engineer, may bewilder the motorist and aggravate the congestion it was designed to relieve. A system of signing at an expressway interchange may fail to adequately convey the intended message to the traffic stream. A system of speed zoning designed to select a reasonable and prudent speed for the motorist may go unheeded. A meticulously designed, ultra-modern highway may produce a rash of accidents.

In the face of such setbacks, the traffic engineer has a tendency to feel frustrated and to condemn the low level of intelligence of a motoring public seemingly bent on self-destruction. How many times have we heard an engineer exclaim: "What can you do? You build the finest possible facility only to have it fail because of the stupidity of motorists!"

This is a point of view which discloses a deficiency in the resources and abilities of the traffic engineer. The job of the traffic engineer is not to move vehicles with efficiency, but rather to move *people* safely and expeditiously. A major factor in every traffic engineering problem is the man behind the wheel. Not man as we would like him to be—but man with all of his weaknesses and limitations, as well as his "awful wisdom" and capabilities. Our highway facilities must be designed to accommodate man as we find him, and it behooves all traffic engineers to direct greater study toward a better understanding of mass motorists.

Today, the traffic engineer's problem is further complicated by the acquiescence of motor vehicle manufacturers as they cater to the weakness of the American public for speed and horsepower. Motor vehicles which rattle and vibrate when they approach unsafe speeds are rapidly becoming rare on the American scene. They are being replaced by smooth-running, silent, and sleek power plants that rapidly reach speeds of 70 or 80 miles per hour without any audible or visible evidence of the diminishing margin between safety and impending tragedy.

Faster, longer, and wider cars in the hands of motorists whose responses, reflexes, and capabilities are unable to adjust as rapidly as the manufacturers can bring out new models hastens the obsolescence of any already overtaxed highway system.

It seems only logical that the traffic engineer should begin to question, in a voice loud and clear, the growing incompatability of the vehicle, the driver, and the road.

Jos E Havemner
Director

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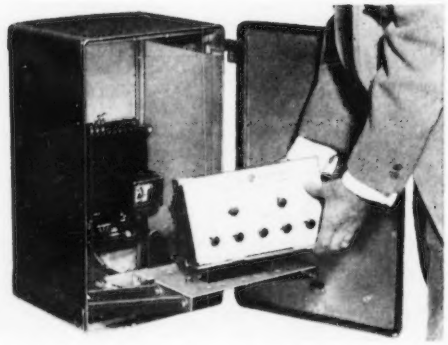

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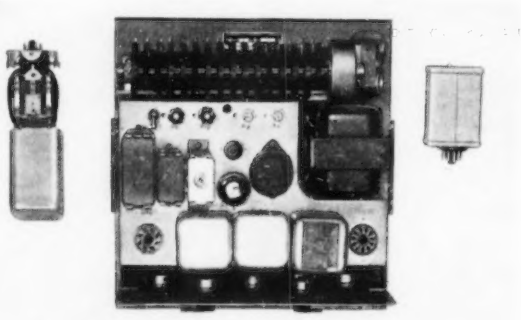

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The Most Comprehensive Study Ever Undertaken

The Port of New York Authority and The Triborough Bridge and Tunnel Authority begin studies of all phases of the arterial traffic problem in the New York - New Jersey Metropolitan area

Prepared by the Public Relations Department, Port of New York Authority

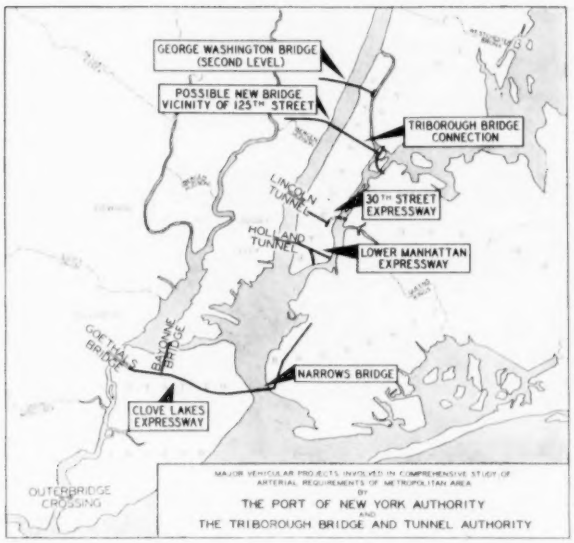


Fig. 1

ON FEBRUARY 15th the Port of New York Authority and the Triborough Bridge and Tunnel Authority began a comprehensive study of all major phases of the arterial traffic problem in the New York-New Jersey metropolitan area—the greatest center of land, sea and air transportation in the country. The study, being made jointly by the two government agencies, will develop for the years immediately ahead the pattern of construction of new crossings, connecting arterial highways, local expressways and such parking facilities as may be incidental to the construction of these arterial projects. Such public projects supplementing and carefully coordinated with the federal-state highway systems in New York and New Jersey would be designed to facilitate the movement of traffic in the metropolitan district, and to relieve local communities in both states of the intolerable street traffic congestion now costing more than a billion dollars a year in lost time and business in the City of New York alone.

The study, to be completed in the late fall, is being made by the staffs of the two agencies and outstanding consultants in the various survey fields.

Announcement of the sweeping study was made on February 15th by Acting Chairman Bayard F. Pope of the Port Authority and Chairman Robert Moses of the Triborough Authority and their associates. The executive responsibility for the joint study is assumed by Executive Director Austin J. Tobin of the Port Authority, and General Manager George E. Spargo of the Triborough Authority.

During the course of their development the plans for the studies were reviewed by the Commissioners of the Port Authority with the Governors of the two states. Previously, the Commissioners of the Triborough Authority had reviewed the program with Mayor Robert F. Wagner.

The study embraces the possible construction of the Narrows Bridge between Brooklyn and Staten Island and approaches; a new lower level of the George Washington Bridge and connections to and over the Harlem River; a new bridge spanning the Hudson River in the general vicinity of 125th Street, Manhattan, and connections with the Triborough Bridge and Harlem and East River Drives; a lower Manhattan and a 30th Street crosstown expressway; and offstreet parking facilities at or in the vicinity of the approaches of such facilities, or in outlying areas in New York, and in the vicinity of the Hudson River crossings in New Jersey where motorists may park who are bound for Manhattan and wish to complete their journeys by some other means of transportation.

In addition, the "package" study by the two agencies is being devoted to the possible construction of approaches and arterial highway systems to move existing and future traffic over and around the congested areas of the metropolitan region of New York and New Jersey, and particularly over and around Manhattan. The study takes into consideration the critical need to reduce to a minimum the number of people and the amount of property to be disturbed by public construction that might be indicated by the study.

At the meeting on February 15th, Messrs. Moses and Pope stated that the critical need for "an over-all solution of the problem of destructive traffic congestion in the bi-state metropolitan area" made it imperative that the two agencies, (with the full cooperation of Governor Dewey and Governor Meyner, highway officials of the two states, Mayor Wagner and the members of the Board of Estimate of New York City, as well as other local officials, civic organizations and the press in the two states) had to "pool resources and efforts" in order to solve the problem of paralyzing traffic congestion.

"An estimated 385,000,000 vehicles entered, left or passed through Manhattan Island in 1953. The situation is serious and must be handled so as to preclude piecemeal traffic relief," the two officials declared. "Total trans-Hudson traffic in the area by tunnels, bridge and ferries added up to about 73,500,000 vehicles in 1953. By 1960 the continuing upward trend will send that figure soaring to 95,000,000. The East and Harlem River bridges and tunnels carried an estimated 311,500,000 vehicles in 1953, and that number is increasing steadily. No partial solution of such a problem

will be of any real help to the metropolitan area in the next decade and an over-all solution can be achieved only by the joint efforts of all the official agencies involved. Of these agencies, the two public bridge and tunnel authorities must bear the heaviest and most direct responsibility. They are the agencies in the best position to work together toward the common goal of arterial traffic relief."

Need for Immediate Relief of Interstate Vehicular Congestion in the New York-New Jersey Metropolitan Area

Since the end of World War II, the vehicular traffic between the States of New Jersey and New York during peak periods has taxed the capacities of the Holland and Lincoln Tunnels and the George Washington Bridge. In 1949 and again in 1953 the Port Authority undertook origin and destination vehicular traffic surveys. Both of these surveys indicated that the fastest growing trans-Hudson traffic has its origin or destination in places other than Manhattan Island.

More than 55 per cent of this travel on weekdays and 70 per cent on Sundays does not start or end in Manhattan. Nearly a fourth of it goes to points north or south of Manhattan. Such traffic, of course, can best be served by the construction of a by-pass route south of Manhattan across the Narrows between Staten Island and Brooklyn, and by a new crossing north of the George Washington Bridge. The New York State Thruway Bridge spanning the Hudson River between Nyack and Tarrytown will help relieve the need for a new northern crossing.

The Port Authority already has moved to relieve the pressure on the Holland and Lincoln Tunnels through the construction of a third tube of the Lincoln Tunnel. This two-lane underwater roadway, to cost about $100,000,000, was started in September 1952 and is expected to be completed in 1957. It will increase the annual capacity of the Lincoln Tunnel by 50 per cent.

Fig. 2
Traffic Congestion on New Jersey entrance ramp to Lincoln Tunnel.

Triborough's five-year $80,000,000 program for construction of arterial approaches and connections to its facilities, eliminating many bottlenecks, is progressing rapidly and will be completed in three years. This supplements the federal-state arterial highway program in Westchester, New York City and on Long Island.

Preliminary studies by the Port Authority of the physical and economic practicability of an entirely new four-lane, two-tube tunnel between the Holland Tunnel and the Lincoln Tunnel indicate that it would be necessary for the structure, with proper approach systems, to be four and a half miles long, extending from the New Jersey meadows to the east side of Manhattan Island. An estimated cost of $350,000,000 for such a facility makes its construction impractical.

Among the factors considered in developing the various phases of the joint agency study were the tremendous growth in population and development of Bergen County and other counties in Northern New Jersey, and in Long Island and Westchester in New York during recent years. The opening of the New Jersey Turnpike and the future completion of the Cross Bronx and Major Dugan Expressways and the Harlem River Drive extension, the Long Island Expressway, the New England Thruway, and the rest of the arterial highway system in New York City on the New York side, and the Garden State and Palisades Interstate Parkways in New Jersey, also have stimulated and will continue to induce heavy traffic increases on the George Washington Bridge and throughout the entire area.

All of these facts and considerations have prompted these two public agencies jointly to undertake studies which will embrace the following:

1. A new study of the Narrows Bridge between Brooklyn and Staten Island to facilitate the development of the Borough of Richmond and to provide a by-pass route south of Manhattan for New Jersey-Long Island traffic, and for through traffic moving between the South and West and New England.

   This study will cover expressway and parkway connections with the Gowanus Improvement in Brooklyn, the Long Island parkway and expressway system, and across and along Staten Island to the three Port Authority bridges leading to New Jersey.

   The Narrows Bridge is essential to the direct and expeditious interchange of traffic between New Jersey and the Long Island and New England areas. The heavy volume of traffic between these areas is now faced with serious delays and congestion. These can be substantially relieved by the construction of a Narrows Bridge permitting motorists to avoid circuitous, congested routes and to move directly between New Jersey and Long Island by way of Staten Island.

   The Triborough Bridge and Tunnel Authority is authorized by the laws of the State of New York to construct a bridge across the Narrows between the Boroughs of Brooklyn and Richmond. In 1949 the United States Government gave a permit to the Triborough Authority to construct such a bridge just north of the United States Government reservations at Fort Hamilton in Brooklyn and Fort Wadsworth in Staten Island.

   The legal and other aspects of financing and construction of the Narrows Bridge by the Port Authority will proceed if the preliminary studies indicate that this bridge can ultimately be made a self-supporting project. The study will include methods by which the bridge may be built, operated and maintained by the Triborough Bridge and Tunnel Authority.

   The Triborough's contracts with its bondholders would prohibit the financing of a Narrows Bridge prior to 1957, and the coverage requirements of those contracts

would undoubtedly make such financing difficult for a much longer period, particularly in the light of the Triborough's $80,000,000 program of approaches and arterial construction and the financing of the Coliseum.

2. A lower level of the George Washington Bridge to provide new lanes of vehicular traffic, combined with new and expanded approaches on both sides of the Hudson and over the Harlem River, to accommodate the increasing proportion of traffic moving between New Jersey and East Bronx, lower Westchester, Queens and Long Island points.

In the original design of the George Washington Bridge, provision was made for a second level below the existing roadway. An immediate study will be undertaken of the addition of this second level for new lanes of vehicular traffic. The approaches and connections on both sides of the Hudson River will be of major importance in this survey.

Fig. 3
Traffic on the George Washington Bridge.

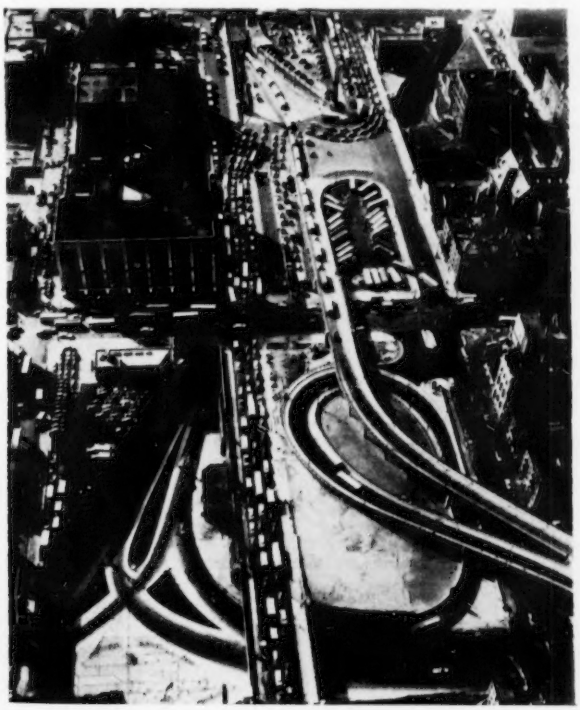
3. A possible new bridge spanning the Hudson River in the general vicinity of 125th Street, Manhattan, integrated with the Triborough Bridge crossings of the Harlem and East Rivers and the East and Harlem River Drives in New York, and with appropriate arterial highways in New Jersey.
4. Review of the need for trans-Manhattan vehicular facilities (Lower Manhattan Crosstown Expressway and the 30th Street Expressway) for local traffic in the light of the possible new by-pass routes across the Narrows and upper Manhattan for through traffic between New Jersey and Long Island.

   A study also will be made of the physical and economic practicability of a 30th Street Crosstown tunnel as an alternative to an elevated expressway.
5. As an integral part of the joint studies of major bridge and approach facilities and other arterial highways, all studies having to do with approach highways and expressways will include recommendations as to the possibility of off-street parking facilities either beneath the elevated expressways or on independent sites adjacent to the expressways.

The study will also include an exploration of possible peripheral parking facilities in the outlying areas of New York City and in the State of New Jersey in order to provide traffic relief during the peak hours of travel at the vehicular crossings. These parking facilities would be used by motorists bound for Manhattan who wish to complete their journeys by other means of transportation.

The study, of course, will take into consideration the need for coordination with existing and projected arterial highway systems of New Jersey, New York and Connecticut.

In accordance with the financial policies that have governed the development of the Port Authority and the Triborough Authority, no projects involved in the study will be recommended for construction by the two agencies unless the costs and traffic estimates indicate that they will ultimately be self-supporting as units in the capital program of port improvements which will continue to be required if New York and Northern New Jersey are to maintain their pre-eminence as the world's greatest and most prosperous port district.



Margaret Bourke White

Fig. 4
Aerial view showing traffic backed up at New York exit and entrance of the Lincoln Tunnel.

Staff work on the Triborough Bridge and Tunnel Authority will be under the direction of Assistant General Manager Arthur S. Hodgkiss and Consulting Engineer William S. Chapin. For the Port Authority, staff work will be under the direction of Director of Port Development Roger H. Gilman. Chief Engineer John M. Kyle, Chief of the Planning Division Frank W. Herring, and Assistant Chief of the

(Continued on page 200)

Area of Influence of Lots and Garages

By R. H. Burrage (Assoc. Mem., ITE)
Head Terminal Facilities Section, Bureau of Public Roads, Washington, D. C.
and
D. A. Gorman, Highway Engineer
Bureau of Public Roads, Washington, D. C.

This paper is the second of three Spot Studies in Parking Research which were presented to the Parking Project Committee at last year's Annual Meeting of the Highway Research Board.—EDITOR.

THIS STUDY was undertaken primarily because of a request from a member of the District of Columbia Motor Vehicle Parking Agency, who reported that consideration was being given to the possible construction of a large new parking facility, perhaps an underground garage, in the vicinity of Franklin Square (bounded by 13th, 14th, I and K Streets.) It was felt that there was some question whether such a facility would serve the demand of shoppers or of drivers destined for F and G Streets, the core of the Central Business District.

The five garages and one lot studied are listed on the tabulation, and their location is shown on the key map. Two are on I Street, three on K Street and one on L Street, and their distance from G Street ranges from 1,200 to 2,000 feet. A variety of types is represented, since there is one parking lot, one automatic or mechanical garage, one "park-at-your-desk" garage (in an office building), one garage catering largely to transients, one catering about equally to transients and "regulars," and one handling "regulars" almost exclusively.

The field work was done on June 2, 3 and 5, 1952, from 10 a.m.-5 p.m., using two observers at each facility. Interviews were taken with as many as possible of the parkers as they returned for their cars, since this involved no inconvenience to the drivers and also produced more reliable data on destinations. It should be noted that at each facility only the transient parkers were interviewed, although at the Cafritz garage on K Street data was taken from the records to permit a separate showing of the destinations of the monthly or "regular" parkers.

Trip Purpose:

The proportion of shoppers ranged from 2.1 percent to 5.6 percent, and averaged only 3.4 percent, clear evidence that the parking facilities in the general K Street area do not serve the downtown shoppers. For the six facilities combined, the trip purposes were as follows:

Purpose	No.	Percent
Shopping	18	3.4
Business	300	57.2
Work	87	16.6
Dr.-Dentist	63	12.1
Social, Recreational, Eat	55	10.5
Other	1	0.2
Total	524	100.0

Distance Walked:

Facility	Average Distance Walked	No. Parkers
Tower Bldg. Lot, 1401 K St.	395 ft	141
Park-at-Desk Garage, 1625 I St.	507 ft.	87
Parkomat Garage, 1426 K St.	515 ft.	71
Dezendorf Deck, 1423 L St.	625 ft.	120
Dezendorf Garage, 1419 I St.	685 ft.	138
Cafritz Garage, K St.	1,136 ft.	19
All facilities	565 ft.	576

Distances Walked, Combined Facilities	No.	Percent
0-100 ft.	86	14.9
100-200 ft.	113	19.6
200-300 ft.	15	2.6
300-400 ft.	21	3.6
400-500 ft.	53	9.2
500-600 ft.	77	13.4
600-700 ft.	51	8.9
700-800 ft.	66	11.5
800 ft. and over	94	16.3

The destinations and hence the distances walked are shown graphically on the series of maps, and it will be noted that of the 576 parkers with known destinations, only 10 walked to G or F Streets, although several went that far by bus or taxi. 84 percent of the parkers walked less than 800 feet, while the distance to the shopping area is from 1,200 to 2,000 feet.

A special tabulation of the records of the monthly-rate or "regular" parkers at the Cafritz K Street garage shows an average walking distance of 1,305 feet, more than double the average distance walked by the transient parkers at the six facilities. This is not surprising, since this group is very largely all-day or long-time parkers, paying a lower fee.

Length of Time Parked:

The average length of time parked ranged from 2.2 to 3.1 hours at the six facilities, the average at all being 2.6 hours. The Parkomat Garage had a larger proportion of short-time parkers than any other, due probably to its rapid handling service and to the fact that it offers a lower fee for 30-minute-or-less parking.

Fee Schedules:

For periods up to 7 hours, affecting over 90 percent of all the transient users of these facilities, the rates are identical at five, and very slightly different at the Parkomat, which offers one-half hour for 20 cents and 40 cents for the first hour.

Mode of Travel, Facility to Destination:

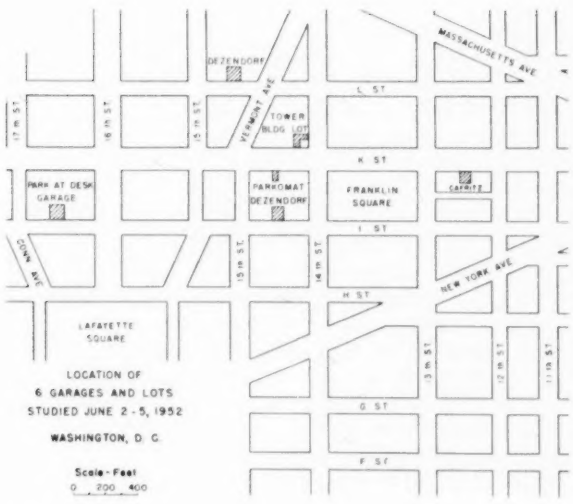
As might be expected, 97 percent of the parkers walked to their destinations, only 3 percent using taxis or mass transportation.

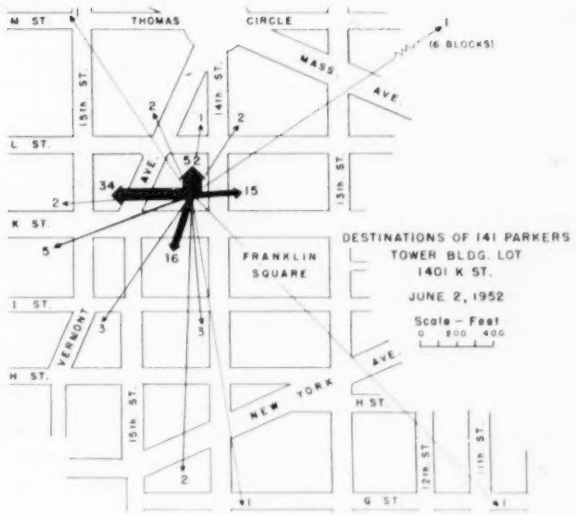
STUDY OF FIVE GARAGES AND ONE LOT, K STREET AREA, WASHINGTON, D. C., JUNE 1952

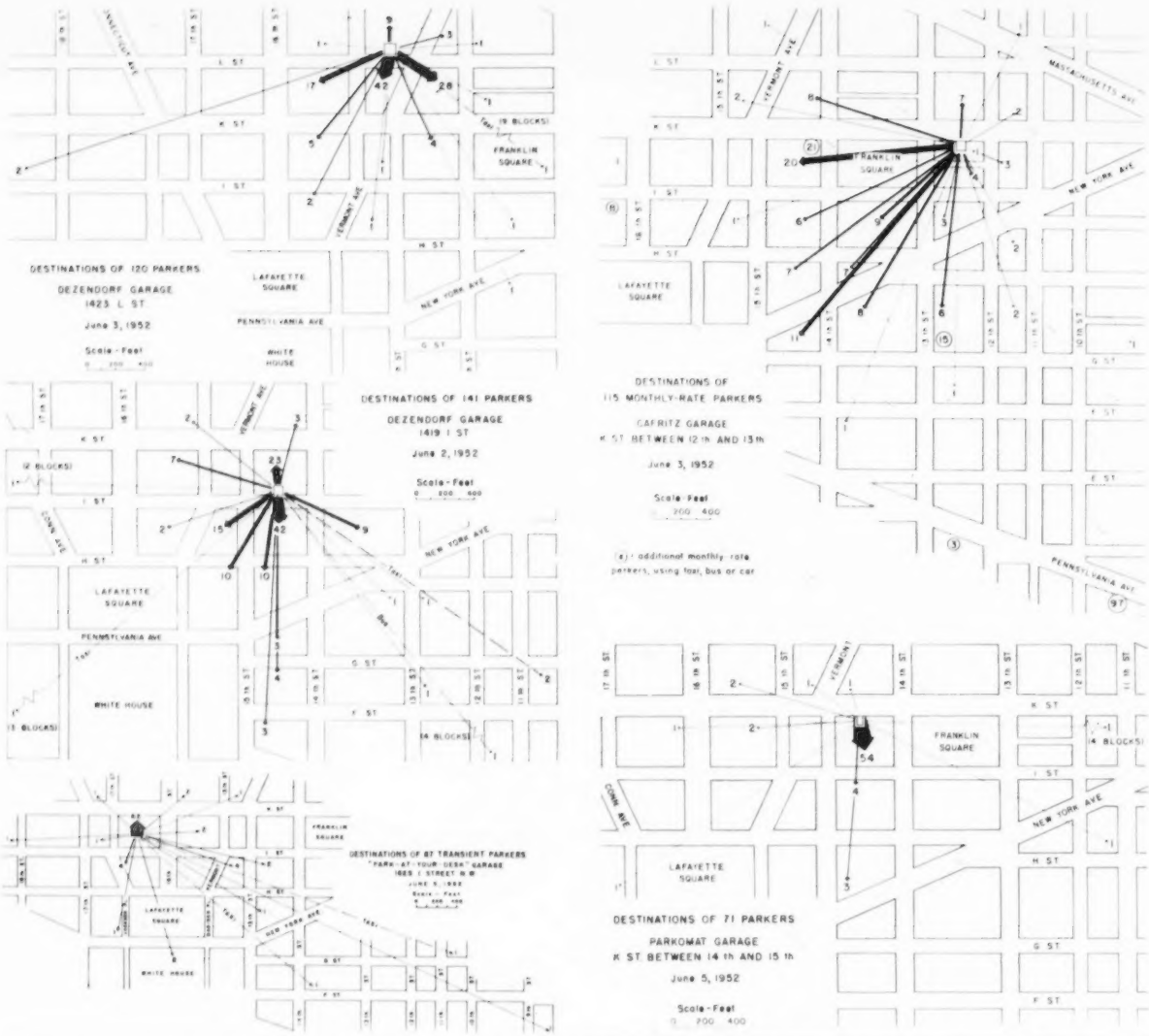
Name of Facility Address Date of Study — hours	Tower Bldg. Lot 1401 K St., N. W. June 2, 1952		Parkomat Garage 1426 K St., N. W. June 5, 1952 10 a. m. - 5 p. m.		Dezendorf Deck 1423 L St., N. W. June 3, 1952 10 a. m. - 5 p. m.		Dezendorf Garage 1319 I St., N. W. June 2, 1952 10 a. m. - 5 p. m.		Park at Your Desk Garage 1625 I St., N. W. June 5, 1952		Cafritz Garage K St. between 12 & 13 June 3, 1952 10 a. m. - 4 p. m.		6 Facilities Combined	
Capacity (spaces with clear aisles)	82		72		154		132		120 (transients)		158		1319	
No parkers interviewed (transients)	147		72		124		143		91 (transients)		20 (transients)		596	
(monthly)											115 (monthly)			
Distance walked by parkers	**No.**	**Percent**	**No.**	**Percent**	**No.**	**Percent**	**No.**	**Percent**	**No.**	**Percent**	**No.**	**Percent**	**No.**	**Percent**
0-100'	21	14.9	37	50	2	1.7	6	4.3	28	32.2	2	10.5	86	14.9
101-300'	74	51.8	32	47	1	0.8	3	3.3	22	25.3			113	19.6
301-500'	6	4.3	—	—	1	0.8	3	2.2	7	8.1	2	10.5	15	2.9
501-700'	2	1.4	1	1	4	3.3	13	9.4			1	5.3	21	3.6
701-900'	2	1.4	—	—	11	15.8	6	4.3			2	10.5	53	9.2
901-1100'	8	5.7	18	25	37	29.5	32	23.9	2	2.4			77	13.4
1101-1300'	10	7.1	—	—	12	10.0	26	18.8	3	3.4			51	8.9
1301-1500'	4	2.8	—	—	13	10.9	10	7.1	10	11.5	1	13.6	66	11.5
1501' and over	15	10.6	13	18	17	14.1	24	17.4	19	21.9	4	47.6	94	16.3
Total	141	100.0	71	100	121	100.0	140	100.0	87	100.0	19	100.0	576	100.0
Unknown	6		1		3		3		4		1		20	
Average distance walked, feet	345.0		335.0		629.0		686.0		367.0		1146.0		565 ft.	
Length of time parked														
0-1 hr.	15	10.6	14	19.5	17	9.7	14	9.8	7	8.0	2	10.0	62	11.0
1-2 hrs.	32	22.5	34	48.1	60	34.4	29	14.0	10	11.5	4	20.0	104	18.4
2-3 hrs.	56	40.0	18	25.0	59	33.6	31	21.3	22	25.3	5	25.0	143	25.3
3-4 hrs.	14	11.2	12	16.7	14	11.4	29	14.0	11	12.5	5	25.0	80	14.1
4-5 hrs.	11	8.2	4	5.3	14	11.4	13	9.1	12	13.8			54	9.6
5-6 hrs.	6	4.2	2	2.8	8	6.5	6	3.6	4	4.6			27	4.8
6-7 hrs.	1	0.8	2	2.8	1	0.8	6	3.6	4	4.6	1	5.0	17	3.0
7-8 hrs.	4	3.5	1	1.4	4	3.2	10	7.1	7	8.0			26	4.6
8-9 hrs.	2	1.7	3	4.1	3	4.1	10	7.0	6	6.9	1	5.0	27	4.8
9 hrs. and over	3	3.0	3	4.1	4	4.9	2	4.8	—	—	2	10.0	25	4.4
Total	129	100.0	72	100.0	123	100.0	143	100.0	87	100.0	20	100.0	565	100.0
Unknown	18		0		1		1		4		0		31	
Average time parked	2.3 hrs.		2.2 hrs.		2.3 hrs.		4.4 hrs.		2.9 hrs.		3.7 hrs.		2.6 hrs.	
Trip Purpose														
Shopping	5	3.4	2	2.8	4	3.2	8	5.6	2	2.2	1	5.0	18	3.4
Business	106	73.4	18	25.4	27	22.0	84	58.9	65	71.4	17	85.0	100	57.2
Work	—	—	19	27.6	47	38.2	38	26.6	1	1.1	1	5.0	87	16.6
Eat or Drink	24	16.1	—	—	34	27.6	—	—	5	5.5	—	—	63	12.1
Social, Rec., Etc.	11	7.5	12	14.1	11	9.0	14	9.8	18	19.8	1	5.0	55	10.5
Other	1	0.7	2	2.8	—	—	—	—	—	—	—	—	3	0.2
Total	147	100.0	84 [1]	100.0	123	100.0	143	100.0	91	100.0	20	100.0	524	100.0
Fee Schedule														
1st ½ hr.	0.35		0.20		0.35		0.35		0.35		0.35			
1st hr.	0.35		0.40		0.35		0.35		0.35		0.35			
2 hrs.	0.50		0.55		0.50		0.50		0.50		0.50			
3 hrs.	0.65		0.70		0.65		0.65		0.65		0.65			
4 hrs.	0.80		0.85		0.80		0.80		0.80		0.80			
5 hrs.	0.95		1.00		0.95		0.95		0.95		0.95			
6 hrs.	1.10		1.15		1.10		1.10		1.10		1.10			
7 hrs.	1.25		1.30		1.25		1.25		1.25		1.25			
8 hrs.	1.40		1.45		1.40		1.40		1.25		1.25			
9 hrs.	1.55		1.60		1.55		1.55		1.25		1.25			
10 hrs.	1.70		1.75		1.70		1.70		1.25		1.25			
11 hrs.	1.85		1.90		1.85		1.85		1.25		1.25			
12 hrs.	2.00		2.05		2.00		2.00		1.25		1.25			
Maximum daytime							None							
" " 24 hrs.					2.00									
6 p. m. - 2 a. m.	0.35		0.50		0.50		0.50		1.50					
2 a. m. - 8 a. m.			0.50		15¢/hr.									
Monthly rate reserved					25.00									
" " roof					20.00									
Spaces reserved, monthly tenants														
Individuals					110						139			
Organizations											123			

[1] From study January 24, 1952

Method of Travel, Garage to Destination														
Walk	141		122		140		85		19		366		1 97.0	
Taxi	—		1		1		5		1		8		1 3.0	
Mass Transportation	—		—		2		—		—		2			
Total	141		123		143		91		20		377		100.0	
Unknown	6													







COMPREHENSIVE STUDY

(Continued from page 197)

Planning Division Edward G. Wetzel will be associated with Mr. Gilman in the direction of the staff project.

Both the Port Authority and the Triborough Authority will absorb staff costs. The cost of consulting services will be divided equally between the two agencies.

The Triborough Bridge and Tunnel Authority will retain the engineering firm of Madigan-Hyland to make the study of New York parking facilities. The Port Authority will retain the consulting firm of Edwards, Kelcey & Beck to study such parking facilities in New Jersey.

On the Narrows Bridge, the Triborough Authority will retain the consulting engineering firm of Ammann & Whitney for the study of the bridge structure; the firm of Madigan-Hyland for the study of the Brooklyn approaches, and the firm of Andrews, Clark & Buckley for the Staten Island connection between the Narrows Bridge and the three Port Authority bridges leading to New Jersey.

For the study of the second level of the George Washington Bridge, the Port Authority will retain Ammann & Whitney for the study of the bridge; the firm of Andrews, Clark and Buckley for the New York approaches, and the firm of Edwards, Kelcey & Beck for the New Jersey approaches.

For the 125th Street Bridge study, the Port Authority will retain Ammann & Whitney for the study of that bridge. The Triborough Authority will retain the same consultant for changes in the Manhattan approaches to the Triborough Bridge. The Triborough Authority will retain Madigan-Hyland for the study of the approach connection between the Hudson River crossing and the Triborough Bridge while the Port Authority will retain Edwards, Kelcey & Beck for the study of the New Jersey approaches.

The Port Authority will retain the consulting firm of Coverdale and Colpitts for the study of traffic and revenues at all three bridge crossings involved in the joint studies.

On the study of the Manhattan expressways, the Triborough Authority will retain Andrews, Clark & Buckley for the 30th Street elevated expressway, and the firm of Madigan-Hyland for the Canal Street elevated expressway. The Port Authority will retain Fay, Spofford & Thorndike for the study of a 30th Street Crosstown Tunnel.

24th Annual ITE Meeting Paper

No. 8, Presented at the 4th Technical Session which was devoted to the subject, Administration, Thursday morning, October 1, 1953.

Traffic Controls in the Vicinity of School Zones Part I

By Lawrence Lawton (Assoc. Mem., ITE)
Director of Traffic Planning, Department of Traffic, City of New York

This paper has been prepared as part of the work of the committee on School Crossing Protection of Department No. 3. Members of the committee at the time this paper was prepared include: L. Lawton (chairman), O. K. Anderson, M. A. Conner, R. S. Deetz, R. D. Dier, D. J. Hanson, G. W. Howie, L. Johnson, R. W. Kerslake, I. O. Kies, W. G. Klett, T. A. Wiley, and R. M. Wray.

PERHAPS THE MOST pressing problem that traffic agencies deal with concerns the safe crossing of children on their way to school. Requests constantly pour in for more signs, painted crosswalks, traffic signals, and policemen. These come from both individual parents and well organized groups who are sincerely convinced that the measures they advocate are vitally necessary.

The welfare of their children is the paramount concern of all parents. Protection of the young is one of the strongest instincts known in nature. It is no surprise then that parents will demand any measure which they feel will in the slightest bit increase the safety of their youngsters. The traffic engineer can not help but sympathize with the fears of parents. It is almost an overwhelming temptation to accede to these requests.

Furthermore, school child protection was one of the earliest endeavors in the realm of traffic control. Some of the practices which have evolved do not seem right in the light of present day knowledge. Yet the demand for similar measures continues unabated for hundreds of other school crossings.

Public officials have genuinely tried to adhere to what they believe is reasonable and proper. They also know that comparatively few accidents happen to school children at crossings when they are going to and from school. At the same time traffic engineers are plagued by a host of other problems which demand an immediate answer. The result has been to utilize the past precedents established in the community. It has thus come about that school crossing protection is the only large area in traffic control in which lack of uniformity is the rule rather than the exception.

The time has now come when it is imperative to set a firm and uniform policy. The present practice of fighting a defensive holding action on each school crossing is time consuming and ineffective. Having agreed on a policy the traffic engineer should set up a program of signs, signals, markings, and crossing personnel to apply equally to all schools. By this positive action he can gain the increased respect of the public and reduce the time expended in school crossing problems.

Locating the Crossing

Hold Amount to a Minimum

For a number of reasons it is desirable that the number of school crossings be held to a minimum. If too many are designated, motorists and children will tend to be less alert at crossings. It has always been a problem to organize and maintain a good school boy patrol system. The more crossings that are established, the more difficult it is to keep the patrols functioning.

Finally the school crossing program imposes a very big load on the traffic agency. Where warranted, signals, signs, and markings, must be installed and adequately maintained. It is probable that the renewing of painted school crosswalks consumes more man hours than any other maintenance activity of urban traffic departments.

The Axis Theory

Wherever possible there should be only one crossing of an arterial street. This type of crossing is most likely to warrant the most restrictive type of control—a policeman or traffic signal.

The first step is to select one of the four intersections surrounding the school as the "key corner." As illustrated in figure 1, this is corner "A". Then all school crossings on major streets should be located on an axis passing through this key corner. The two streets which form this axis, usually at right angles, are known as the "school-ways".

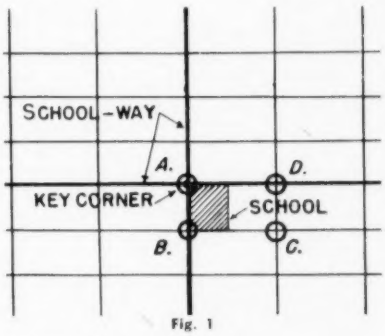


Fig. 1

Picking the Key Corner

There are several criteria for picking the key intersection. If there is an existing signal in the vicinity of the school it should be chosen as the key corner. Occasionally investigation will reveal an unusually large amount of turning movements at the location initially selected. Or it may be a particularly complex intersection. In that event, a new key corner should be chosen. The location of an existing Police Department crossing post may help determine the key corner. The school may be at the end of a long block, and in that case one of the two intersections at that end of the block should be used.

Exceptions to the Axis Theory

When the street grid changes character in the vicinity of the school, it is not possible to follow a rigid rule in establishing school-ways. One example is shown in figure 2. Existing traffic signals are at intersections "A" and "B". A request was made for a school signal at corner "C". A signal would not be desirable here because some drivers do

not stop back of the cross walk on the flat side of a "T" intersection. Furthermore, "A" and "B" are at the half cycle points of the signal system on the major arterial street. At such locations the least amount of vehicles are stopped by a red light and therefore are the safest locations for a pedestrian crossing. The request was turned down and the system of school-ways shown in figure 2 was established.

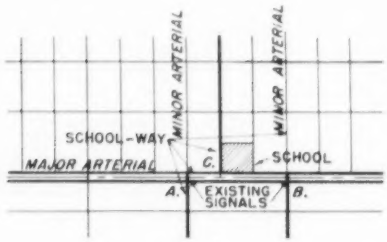


Fig. 2

Warrant for Additional Arterial Crossing

Invariably parents will protest when the location of the school-way is on the far side of the school. They feel their children should not have to walk the extra distance to get to school. As the distance involved gets larger, their argument becomes more valid. It is suggested that an additional school-way, which will necessitate the use of a policeman or traffic signal, be sanctioned only if the following condition is met. That is no signal or officer protection is available without an added 600 feet of walking distance to the nearest school gate.

Use of Restrictive Control

If reasonable safety for crossing without control of traffic is to be assured, natural gaps in traffic should be sufficient for the child or group to walk, not run, from one curb to the other. Unfortunately, some schools are located so that appropriate gaps for pedestrians do not often appear. Children do not have the patience of adults, and if the time between gaps is more than a minute, they will not wait, but attempt to cross.

Proper Function

When the volume of traffic is too great, it is necessary to provide either police control or traffic signal operation to insure suitable gaps in traffic. It is to be stressed that a traffic light can not guard a child against his own carelessness. Some children may be impatient and cross the street against the signal. Others may place too much reliance on the green signal and not watch for vehicles on the cross street turning into their paths on a green signal.

Improper Function

It is not the purpose of a signal to train a child how to cross a street. If the traffic is not too heavy it is the responsibility of the child not to cross when vehicles approach. At school crossings adjacent to the school this responsibility is shared by the school safety patrol.

It is believed by some parents that school children cannot be expected to have the mature judgment necessary to cross a street, even when there are a sufficient number of gaps in traffic. However, accident records show that only a small proportion of accidents occur to children at school crossings on their way to or from school. Most of these accidents are listed as crossing against traffic signals, crossing from between parked cars, running into roadway. As a matter of fact, many children are injured and killed running into the sides of moving vehicles.

Admittedly, it is a very hard thing to train children to look in both directions before crossing a street. Difficult it is—yet there is no other way. There is no mechanical or electrical device which can assume this responsibility for a child.

Warrants for the Use of Restrictive Control

As has been previously stated, a signal or policeman is warranted when there is less than one suitable gap in traffic in a period of one minute. The following gap formula is taken from the Joint I.T.E.—I.A.C.P. Committee Report which appeared in the 1947 Proceedings of the I.T.E.

Assumptions:

1.—Average walking speed of children is 3.5 feet per second.

2.—Maximum average time which will be tolerated between gaps is one minute.

Definitions:

D—width of street in feet

V—volume of traffic in both directions (vehicles per hour) at which average time between gaps is a maximum of one minute.

By using Poisson's Exponential Series:

$$V = \frac{29000\ (2.322 - \log D)}{D}$$

There are additional factors which should be considered to equate this basic probability formula to what happens on the street.

Perception and Reaction Time

This mathematical derivation does not allow any time for the child or school boy patrol to analyze each crossing situation and determine whether it is safe to cross. Mr. Robert Dier, in a study published in the January, 1952 Traffic Quarterly, determined this time with a stop watch. The school child perception and reaction time was found to be approximately three seconds. Or expressed in terms of distance to be added to "D":

$= 3$ seconds $\times$ 3.5 f.p.s. $= 10.5$ or say 10 feet.

Vehicles Not Moving in Curb Lane

The presence or absence of curb parking will also modify the volume of traffic which will permit safe gaps.

A typical condition is shown in figure 3. Here parking is allowed along the length of the main street. Normally, parking will be prohibited in front of the school during hours when the school is in session. Drivers, however, will not stray from the travel lanes when the curb lane is only cleared for a short distance.

Let us consider, in figure 3, children crossing north-bound on their way to school. It is desirable that the school boy patrol not permit children to leave the curb until a safe gap in traffic presents itself. Then the children are at point

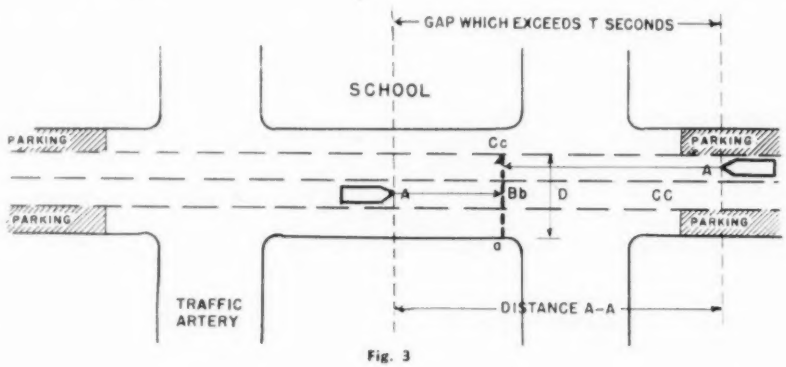


Fig. 3

"a" and no east-bound vehicle should be closer than shown at "A". That is to say that the time for a vehicle to traverse distance AB should be equal or greater than the time for the school child to walk distance a-b. We can, therefore, say that the presence of near side parking along the length of the major street will not affect the critical distance "D".

On the far side of the crossing, the situation is entirely different. Once the child has entered the parking lane he has passed the critical zone in which vehicles travel. The critical walking distance is a-c, from the near curb to the beginning of the far side parking lane. Therefore, where curb parking is not prohibited for a considerable distance along the major street, the width of one parking lane may be deducted from the curb to curb width of the street. For all practical purposes, this width to be deducted may be considered to be ten feet.

Streets Wider Than 40 Feet

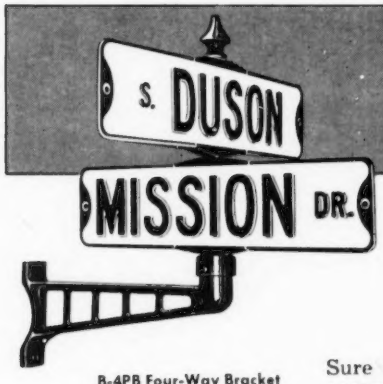
There is a considerable factor of safety in the gap formula which has been presented. The formula evaluates the probability of no moving vehicle being in the critical segment A-A during the length of time it takes a child to cross. However, children can and will start to cross in safety when an east-bound car has passed point B. The same is true when a west-bound vehicle has passed point C. Because of slower walkers and inability of children to judge borderline cases, this factor of safety is by all means desirable. However, it has been found in practice that when the width of the street exceeds forty feet, that the volumes of traffic which will justify police or signal control has been much too low.

One good reason for this observation has been presented in the preceding paragraph. There is also an additional factor to be considered. As the street widths increase past forty feet, the critical volumes become quite small, in the

SAFE GAP TABLE

STREET WIDTH (FEET)		MAXIMUM TRAFFIC VOLUME PERMITTING ONE SAFE GAP MINUTE		
CURB PARKING ALONG MAJOR ST.	MOVING VEHICLES IN CURB LANE	SINGLE CHILD OR SMALL GROUP	MEDIUM GROUP 10' PLATOON	LARGE GROUP 20' PLATOON
24	---	1140	675	480
26	16	1010	620	465
28	18	910	570	450
30	20	815	520	435
32	22	740	500	420
34	24	675	480	405
36	26	620	465	390
38	28	570	450	375
40	30	520	435	360
42	32	500	420	350
44	34	480	405	340
46	36	465	390	330
48	38	450	375	320
50	40	435	360	310
52	42	420	350	300
54	44	405	340	290
56	46	390	330	280
58	48	375	320	270
60	50	360	310	265
65	55	335	285	245
70	60	310	265	230
75	65	285	245	215
80	70	265	230	200

(Continued on page 206)



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Also available as
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Status of Toll Roads in the United States

By PORT OF NEW YORK AUTHORITY — **As of February 1, 1954**

STATE / PROJECT	PROPOSED Miles	IN PROGRESS EST. COMPLETION Year	IN PROGRESS Miles	IN OPERATION Year	IN OPERATION Miles	COST MILLIONS	INTEREST RATE	STATE CREDIT PLEDGED	AUTHORIZATION VESTED IN
COLORADO									
Boulder-Denver Turnpike				1952	17	6.3	2.9	Yes (2)	State Highway Dept.
Under Continental		5 routes under study						Yes	same
CONNECTICUT									
Merritt Parkway				1940	67	38.0 (1)		Yes	State Highway Dept.
Wilbur Cross Parkway				1949					
Fairfield County Thruway	130					238		Yes	same
West Haven-New London	75								same
FLORIDA									
Buccaneer Trail				1950	17	4.6	4.0	Yes	Ocean Highway & Port Authority
Miami-Jacksonville	329					150		No	Florida Turnpike Authority
Titusville-Tampa	128					80		No	same
Overseas Highway					44 (4)	8.5		Yes	State Road Dept.
GEORGIA									
Cartersville-Tennessee Line	65					225		No	Georgia Bridge & Turnpike Authority
Buccaneer Trail Extension	50								
ILLINOIS									
3 projects	280					450		No	Illinois Toll Road Commission
Chicago-Indiana Border	10	1956				50		No	same
INDIANA									
Ohio-Illinois		1955	157			260.0	4.5	No	Indiana Toll Road Commission
IOWA									
Omaha-Davenport	280					250			Legislation under study
KANSAS									
Kansas City-Topeka-Wichita-Oklahoma Line	235					240		No	Kansas Turnpike Authority
KENTUCKY									
Louisville-Elizabethtown	40	1956				30		No	1950 Enabling Act
LOUISIANA									
Lafayette-Latcher	80					100			Louisiana Turnpike Committee
Monroe-Minden	75								
MAINE									
Kittery-Portland				1947	47	15.0 5.6	2.5 2.75	No	Maine Turnpike Authority
Portland-Augusta		1955	66			35.0 (5)	4.0	No	same
MASSACHUSETTS									
Weston-West Stockbridge		1956	123			200		No	Massachusetts Turnpike Commission
Weston-Boston	10					100		No	same
Buzzards Bay-Fall River	33								Dept. of Public Works
MICHIGAN									
Detroit-Bay City	102					100			Michigan State Turnpike Authority
Ypsilanti-New Buffalo	176					200			same
Toledo-Detroit	45					80			same
MISSOURI									
Kansas City-St. Louis-Joplin	458								Under study by 1953 legislative committee
NEW HAMPSHIRE									
Seabrook-Portsmouth				1950	15	7.5	1.6	Yes	State Highway Dept.
Portsmouth-Rochester	20	1956				14		Yes	same
Concord-Nashua		1954	40			21		Yes	same

(1) Amounts shown with decimal indicate actual bond issue. Others are estimates only.

(2) 30% of annual debt service.

(3) Includes PWA and State Highway funds.

(4) 44 mile section of 122 mile road.

(5) $75 million bond issue for $55 million extension plus refunding original issue.

(6) Short term notes.

(7) $150 million issue includes $118 million for this expressway plus refunding above short term notes.

STATE / PROJECT	PROPOSED Miles	IN PROGRESS EST. COMPLETION Year	IN PROGRESS Miles	IN OPERATION Year	IN OPERATION Miles	COST MILLIONS	INTEREST RATE	STATE CREDIT PLEDGED	AUTHORIZATION VESTED IN
NEW JERSEY									
New Jersey Turnpike				1952	118	220.0 35.0 30.0[6]	3.25 3.20 1.875	No	N. J. Turnpike Authority
Jersey City Expressway		1956	8.5			118.0[7]	3.5	No	same
Turnpike extension to New York State Line	20					75		No	same
East-West Turnpike	59					300		No	same
Link with Pennsylvania Turnpike	6					25		No	same
Garden State Parkway		1954	165			285.0[8]		Yes	N. J. Highway Authority
Extension to New York State line	8							Yes	same
NEW YORK									
New York State Thruway		1955	427			500[9]		Yes	N. Y. State Thruway
4 Thruway extensions	108					90[9]		No	same
Southern State Parkway			32			40.0		No	Jones Beach Parkway Authority
NORTH CAROLINA									
Charlotte - Mt. Airy	125					200		No	North Carolina Turnpike Authority
Nag's Head-Virginia line	34					5		No	Carolina-Virginia Turnpike Authority
OHIO									
Pennsylvania-Indiana		1955	240			326.0	3.25	No	Ohio Turnpike Commission
Cincinnati-Cleveland	300					400		No	same
Toledo-Cincinnati									Under study by Lake-Gulf Highway Planning Commission
OKLAHOMA									
Tulsa-Oklahoma City				1953	88	31.0 7.0	3.41 3.84	No	Oklahoma Turnpike Authority
3 projects	320					191		No	same
PENNSYLVANIA									
Carlisle-Irwin				1940	158.9	47.0[10]	2.25	No	Pennsylvania Turnpike Commission
Carlisle-King of Prussia				1950	100.9	87.0	3.25	No	same
Irwin-Ohio Border				1951	67.4	77.5	2.9	No	same
Link with N. J. Turnpike		1954	32.2			15.0 50.0	2.75 3.0	No	same
Norristown-Binghamton			125			250		No	same
Pittsburgh-Erie	120					250		No	same
Harrisburg-Maryland	33					30		No	same
Erie-Ohio Border	60					53		No	same
Erie-Scranton	100					170		No	same
Norristown-Delaware line	20							No	same
RHODE ISLAND									
Westerly-Fall River	50					88			1953 legislation rejected
TENNESSEE									
2 projects	500								Considering legislation
TEXAS									
Dallas-Ft. Worth	33					11		No	Texas Toll Road Authority
Ft. Worth-San Antonio	276					150		No	Charter held by private corporation (11)
Oklahoma line-Houston-Corpus Christi	500					215		No	same (11)
VIRGINIA									
Virginia Beach-North Carolina line	20					1			Carolina-Virginia Turnpike Authority
Richmond-Petersburg	36					57			Commonwealth Turnpike Corporation (12)
Bluefield, W. Va-Mt. Airy, N. C.	70					99			Old Dominion Turnpike Corporation (12)
WASHINGTON									
Tacoma-Everett	70					200			Washington Toll Bridge Authority
WEST VIRGINIA									
Charleston-Princeton		1954	68			96.0[13]	3.75	No	West Virginia Turnpike Commission
Chester-Charleston	162								same
WISCONSIN									
Genoa City-Hudson	287					200		No	Wisconsin Toll Road Commission
Total Proposed	6049					5278			
Total in Progress			1503.7			2218.0			
Total in Operation					740.2	620.0			
Total	6049		1503.7		740.2	8116.0			

(8) $120.9 million @ 3%, $29.1 million @ 2.75%, $135.0 million @ 2.7652% net.

(9) $500 million is limit of State guarantee. Additional amount for Thruway and extensions will require new legislation or funding without benefit of State credit support.

(10) Total cost $77,164,000. Difference from PWA funds.

(11) May be built by Texas Toll Road Authority after 2/26/55.

(12) Recent legislative study committee recommended that these Charters be revoked and that only the State should have authority to construct toll roads.

(13) Additional $37 million needed to complete construction.

(Continued on page 223)

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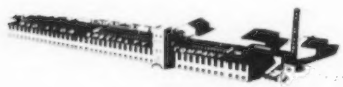

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Greater New York Safety Council Schedules Convention

The 24th Annual Safety Convention and Exposition will be held in New York City at the Hotel Statler from April 5th to 9th. The program includes a session devoted to "Putting Power Into Your Traffic Program." The Moderator will be Dwight Myers (Mem., ITE), Deputy Commissioner and Chief Engineer, Department of Traffic, City of New York. Discussing the Engineering Aspects at this session will be Henry Osborne (Mem., ITE), Traffic Engineer and Advisor, Board of Safety, City of Buffalo, New York.

SCHOOL ZONES

(Continued from page 203)

order of just a few hundred cars an hour. Under these conditions motorists do not drive immediately adjacent to the curb lane. They tend on the average, to keep their cars about halfway between the centerline and the edge of the parking lane. It can then be conservatively said that when the width of the street exceeds forty feet, the critical distance is as follows:

Let S equal curb to curb width in feet
P equal effective width of parking lane, say ten feet

$$\text{Therefore } C = \frac{S-(S-40)-P}{2}$$

Using all of the criteria discussed, the safe gap table has been determined.

Pedestrian Clearance Time

When a group of five or less children cross, no additional clearance time is required. However, a large group of thirty to forty children will form a platoon about twenty feet long in crossing. That is when the first ones are across, the last ones will be about twenty feet from the curb. For each roadway width the critical volumes are tabulated for a small group, a medium size group which forms a platoon ten feet long, and a large group which forms a twenty foot platoon.

Additional Field Studies Needed

It is hoped that the use of this probability type of formula will gain increasing acceptance during the next few years. It will then be possible to accumulate field data which will more accurately evaluate such factors as vehicles moving in the curb lane, average walking speed of school children, and clearance time or distance actually required by large groups of children.

The second part of this paper will be published next month. That section will deal with School Traffic Signals, Personnel at Crossings, and Setting Up a Program.—EDITOR.

Indiana Section, ITE, Co-Sponsors Conference

The Second Annual Conference on Road and Street Traffic Control will be held at Purdue University April 22 and 23 immediately following the four-day 40th Annual Purdue Road School. The conference is sponsored by the University in cooperation with the Indiana Section of the ITE and the Indiana City Engineers Association.

John E. Baerwald (Assoc. Mem. ITE), Research Engineer of the Joint Highway Research Project at Purdue is the conference director.

TRAFFIC NEWS

Traffic Increase and Accident Decrease Go Hand in Hand on New Jersey Turnpike

"The 1953 traffic level for the New Jersey Turnpike is twenty-two years ahead of schedule . . . A total of 22,159,084 vehicles moved over the Turnpike in 1953. . . . The increase in revenue-producing vehicles in 1953 over the preceding year was 22.6 per cent. . . . The Authority's revenues from tolls and concessions in 1953 paralleled this trend in traffic and, overall, the revenues were about two and one-half times what had been predicted by the independent engineers. . . . At frequent periods in 1953 the traffic exceeded the most optimistic expectations, and totals of 80,000 vehicles daily or more were registered on 44 occasions . . . the peak, just short of the 100,000 mark, was hit on August 1 . . ."

The above statements were taken from the Annual Report, 1953, of the New Jersey Turnpike Authority. But contrary to what you would expect, the Turnpike's record of safety also showed remarkable and encouraging improvement.

Much of the Turnpike's safety improvement generated from several important projects: a) Increase in the State Police detachment and the subsequent greater enforcement of regulations. b) Increase in signing, marking, lighting, and protection barriers. c) Better procedures for handling traffic during adverse weather conditions. d) And a continued effort to make the Turnpike the safest highway ever constructed.

a) During 1953 the State Police detachment on the Turnpike was augmented by 15 permanent members, reaching a total of 77 men. This provides a normal patrol of 13 men on duty 24 hours each day, or the equal of one man for each nine miles of highway. This expansion in Police personnel crystallizes the improved safety of the Turnpike through their activities in 1953: In that year a total of 18,574 summonses was issued, of which 15,339 were for speed violations. The remainder were for failing to keep to the right, careless driving and other violations. Summonses issued to speeders and other violators as the result of the use of radar numbered 5,012 in 1953 compared to none in 1952.

b) In addition to emergency signs, there were four other categories of installations: 1) to warn of the strict enforcement of speed limits by radar and patrol cars; 2) on exit ramps indicating lower speed limits in effect on State Highways; 3) on the entrance ramps of interchanges informing of the prohibition of hitchhiking; and 4) large overhead signs at the beginning of the dual-dual section in Elizabeth to indicate that through traffic may use all lanes in either direction.

Additional lighting was provided at the interchanges, in service areas and between the two bridge crossings of the Hackensack and Passaic Rivers. In all, a total of 675 new lighting units, using the latest type mercury vapor lamps, was installed during 1953.

For the guidance of motorists during conditions of low visibility, the Authority provided continuous road striping for the full 118-miles between the left lane and the inner shoulder of both north and south roadways.

Greater protection also was afforded users by the installation of guard rail around all center bridge piers north of Elizabeth where the median strip is somewhat narrower than the 26-foot median which is generally standard throughout the Turnpike.

c) After careful study of conditions in fog-prone areas, it was decided to erect additional regulatory and informational signs. The most important of these were the large neon-lighted signs placed in the northern end of the Turnpike, where traffic conditions are dense, to inform users of fog, ice, snow, or other emergency conditions ahead. These signs carry a large message "Drive Slow" which flashes on and off to attract attention and mention the specific condition. (See Cover and description on Contents Page.) The value of these signs was demonstrated in recent fog and smoke conditions.

d) The Authority staff continued to explore means to reduce cross median accidents even though these have been in the minority in relation to total accidents on the Turnpike; and elimination of headlight glare from opposing traffic lanes in a few areas at curves.

The desirability of using upper beam head lamps for night driving on the Turnpike encouraged the Authority to investigate the erection of a planted barrier at those locations where a combination of line and grade causes opposing headlights to shine in motorists' eyes. Extensive tests were made both on the Turnpike and on an unused runway at the Newark Airport, and others will be made to determine the desirability of improving seeing distances by means of such barrier plantings.

In addition, the Authority is considering the initiation of a research program to be directed by the Bureau of Highway Traffic at Yale University; seeking to improve the design of the median to the point where vehicles may be prevented completely from crossing; may be kept from being thrown into other vehicles traveling in the same direction; and may minimize injury to the driver and damage to vehicles out of control.

These projects and many other factors have been the substance of the ever-improving Turnpike safety program. For all of 1953, the accident records of the State Police disclose a total of 584 accidents, equal to 67.1 for each 100,000,000 miles of vehicular travel. This rate was a reduction of 27.6 per cent compared with 1952 when it was 92.7. During 1953 there were 26 fatal accidents on the Turnpike, causing death to 36 persons, reductions of 21.2 and 23.4 per cent, respectively, compared with 1952.

The Turnpike's fatalities in 1953, using the standard basis of comparison of the national and state governments, and of the National Safety Council, were equal to 4.14 per 100 million miles of travel. The 4.14 rate ranks with the three states and the District of Columbia which reported the lowest rates for vehicular fatalities in the country during 1952. For New Jersey's parallel high-

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ways, (numbers 1 and 130), the indicated fatality rate in 1952, the latest figures available, was equal to 6 per 100 million miles and the national rate for 1953 was equal to 7.0.

Significantly, the Turnpike experienced not a single fatality over seven holiday periods (New Year's, Lincoln's and Washington's Birthdays, Memorial Day, Independence Day, Thanksgiving and Christmas) when traffic was unusually heavy. Furthermore the number of accidents occurring over these holiday periods was greatly reduced to a level far below that on the public highways. Thus, Turnpike safety is under constant study by the Authority and its engineering and traffic divisions with the objective of further improvement in the excellent record which has been established.

Traffic Gets Tedious

All cities have traffic troubles. They differ only in degree and—occasionally—in kind. *Consider the plight of The Hague*, a major city in the Netherlands with a population of 600,000 persons. The city has just completed a new city hall which will concentrate 1,300 officials, formerly scattered about the downtown area, into one building. Officials have only recently awakened to the fact that this concentration will have a considerable effect on the direction of traffic.

Here is a report from The Hague as carried in the current edition of the American Society of Planning Officials' newsletter:

"An inquiry held among the personnel concerned has elicited that 78% of them go to work on their bicycles, 11% use public transport, 1½% a car or motorbike, and 9% walk. As a result of the concentration in the Council House, a large part of the officials living in the new residential districts in the southwest and west of the city will have to use the main traffic road to and from these districts. This will put so heavy an extra load on this traffic way that at peak moments 1,300 cyclists are expected every quarter of an hour. It is very much a matter of doubt whether this and adjacent roads will prove able to bear such a volume of traffic.

"A solution may be found, it is hoped, by staggering office hours."

Second Revision of Manual Issued

The second revision of the Uniform Definitions of Motor Vehicle Accidents, the first since 1947, has just been issued by the National Conference on Uniform Traffic Accident Statistics. Used principally by personnel in motor vehicle accident records bureaus and vital statistics, the manual was revised in order to be a more useful guide for such offices as well as all traffic agencies, insurance companies, and other groups which compile figures on motor vehicle accidents.

The definitions in the manual were formulated for the National Conference on Uniform Traffic Accident Statistics by a committee under the chairmanship of Dr. Halbert L. Dunn, Chief of the Public Health Service's National Office of Vital Statistics. The manual is an important reference for assuring uniformity and comparability in classifying information from traffic accident investigators' and drivers' reports, coroners' and medical examiners' records, and death certificates. It is also used in training courses for traffic officers.

Changes made in the revised manual include a new definition of injury and an appendix defining characteristics of the location of the accident. Injury was redefined to allow rough classification at the scene of the accident. The definition recognizes objective signs of an injury like a bleeding wound or distorted limb; other visible injuries such as swelling, abrasions, or limping; and complaint of pain without visible signs of injury. This method was developed because the previous criterion, need for medical attention within 6 to 12 months of the accident, had proved impractical, because of difficulties in followup by traffic accident records bureaus, difference of interpretation, and in accessibility of hospital and physician records.

A paragraph was added to the section on allocation of motor vehicle accidents according to geographic boundaries. It provides that "motor vehicle accidents on trafficways administered by independent agencies such as turnpike, parkway, military, or freeway authorities or commissions may be classified in a separate category from accidents on other trafficways in a geographic area, but they shall be shown in the total for the area (city, State, county, etc.)." No changes were made at this time in the definition of a motor vehicle accident fatality, and in other respects the manual closely resembles the previous edition.

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Operation Reflecto-Liner

Wald Industries, Inc., Huntingdon, Pennsylvania, manufacturers of an extensive line of traffic marking equipment, have launched a nation-wide tour to demonstrate modern methods for municipal and industrial marking.

Designated as "Operation Reflecto-Liner," this unique demonstration tour was organized for the primary purpose of acquainting public officials, industrial executives and safety engineers with the latest improvements in striping techniques and equipment.

The "caravan" of Wald striping machines, which travels from city to city, includes the Model 345 Truck-O-Liner —for extensive street, highway and airport centerline marking — Models 16, 12, and 8T Reflecto-Liners, and the new Reflecto-Liner Jr., which is specifically designed for marking aisles in industrial plants, parking stalls and lots, crosswalks and "close work." Representatives of Wald Industries conduct demonstrations with these machines, showing the actual operation involved in the application of marking materials. They also explain in detail the practical features of new striping techniques, stressing speed and economy of operation.

The tour's itinerary, to date, is as follows:

March 2—Knoxville (including Oak Ridge), Tennessee
3—Chattanooga, Tennessee
5—Nashville, Tennessee
8—Louisville, Kentucky
15—South Carolina
18-19—Norfolk, Virginia
23—Alexandria, Virginia (including Washington, D.C.)

The Wald demonstration in Louisville coincided with a meeting of the Southern Safety Conference. Representatives from 12 southern states, principally industrial plant safety engineers and state and municipal traffic engineers were present—the latter sponsored the Traffic Engineering Section, Southern Safety Conference, and attended the first annual meeting of the Southern Section Institute of Traffic Engineers, held in conjunction with the Conference.

In each city on the caravan's schedule, a luncheon for visiting officials precedes the actual showing of equipment and traffic demonstration, which is open to the public. The luncheon affords an opportunity for Wald representatives to outline the purpose and objective of the Company's program. Among those in attendance are officials from state and county highway departments, industrial plants, local public works and police departments—individuals who are interested in the improvement of traffic conditions and reduction of accidents through the use of effective aids to traffic control, such as reflectorized marking.

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President Speaks For Toll Roads

The Economic Report of the President, which was transmitted to Congress on January 28, recognizes the importance of highway construction to the economy of the nation and makes certain recommendations with respect to toll roads and their development.

The President's 225-page Report reads, in part, as follows:

"The massive accumulations of need for local, State, and Federal public works are attributable to the growth of our population, its migration, the rise in income and living standards, and the deferrals of construction during World War II and the Korean war. Some of the shortages, especially of highways, are retarding the growth and interfering with the efficient operation of the economy. Steps must be taken to extend and strengthen the Federally aided highway system.

"A part of the Nation's highway needs can be met by the States without straining their budgets, through the construction of toll roads. Toll roads have come to be widely accepted. So far, specific plans have been formulated by the States for only a fraction of the main rural highway routes that could be wholly self-financing toll roads. The development of plans for urban toll roads has proceeded even more slowly. The Federal Government should encourage studies of the economic feasibility of toll road projects, together with engineering surveys, by making advances available to the States for these purposes. It seems likely that, by lifting legal impediments to immediate possession of rights of way and by pushing engineering plans even before projects are authorized, it would become feasible for the States or their special authorities to commence a considerable volume of construction of toll roads within a year."

New Appointments . . .

Hanson Moves To Peoria

Peoria, Illinois, second largest city in the state, with a population of 115,000 has appointed Daniel J. Hanson (Junior Member ITE) as its City Traffic Engineer.

Daniel J. Hanson

Dan goes to Peoria to head the newly created Traffic Engineering Department after serving as Traffic Engineer for the Safety and Traffic Engineering Department of the Chicago Motor Club for two years.

Twenty-five years old, born and raised in Chicago, Illinois, he attended the University of Illinois, receiving his Bachelor of Science Degree in Civil Engineering in 1951 and a year later completed work on his Master of Science Degree in Civil Engineering. He studied under Professor Emeritus C. C. Wiley, the newly elected honorary member of the ITE, and attributes most of his success to the training he received from the professor.

In 1951 he took a job with the City of Champaign, Illinois, and served as an assistant to the City Engineer and was put in charge of all traffic engineering activities. While serving in this capacity he completed work on his Master's Degree writing his thesis on "The Effective Use of Parking Meters." From here his traffic engineering activities were transferred to his home town when he joined the Chicago Motor Club staff.

He is a very active member of the Midwest Section of ITE, having served on four committees in the last two years. In addition, he is a member of the ITE Committee (3-c) dealing with "Traffic Controls in the Vicinity of School Zones." The Western Society of Engineers also claims him as an associate member.

Holmes Accepts New Position

Mr. Robert S. Holmes (Mem., I.T.E.) has resigned his position with the Federal Civil Defense Administration, Washington, D. C., to assume new duties and responsibilities as Executive

Robert S. Holmes

Assistant to the President, Wald Industries, Inc. He joined the staff on February 1, 1954, and will be located in the Executive Offices of Wald Industries in Huntingdon, Penna.

Mr. Holmes will assist the President in the conduct of the Wald Industries sales engineering and promotional programs, to include advertising, public relations, and industrial marketing of new products. One of the new equipment items now in full production is the REFLECTO-LINER, a modern paint striping machine designed for highway and industrial use.

Bob is well known in traffic circles as a member of the Institute of Traffic Engineers and as the Institute's first Executive Secretary from 1947 to 1951. He was also Editor of "Traffic Engineering" magazine, official publication of I.T.E. He was recently elected a Director of the Institute from District 2, which includes the State of Pennsylvania, and serves as Chairman of the important Committee on New Members.

For the past three years Mr. Holmes has served as General Engineer and Director, Emergency Restoration Division, Engineering Office, F.C.D.A. He established the program for stockpiling critical items of engineering equipment in 37 strategic locations throughout the United States. He also organized Advisory Panels comprised of Executives in private industry, in order to develop national and local operational plans for debris clearance and for emergency restoration of water, electric power, gas

(Continued on page 213)

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Personalities

Waters Receives Award

Charles R. Waters, (Mem. I.T.E.) District Engineer for the New York State Department of Public Works, was given the Roy W. Crum Award for Distinguished Service on January 12th during the thirty-third annual meeting of the Highway Research Board in Washington. The award is presented annually in recognition of "outstanding achievement in the field of highway research."

Waters has been engaged for more than 25 years in what might be termed "applied highway research." He has devoted much of his time to the furtherance of investigations, field trials, and experiments to increase the life and durability of pavements, structures, highway signs and markings, and the advancement of traffic engineering particularly in urban areas.

Fabian Bachrach

Charles R. Waters

He received his engineering degree from Union College in 1907. For several years thereafter, he supervised construction of large New York State barge canals and later became assistant deputy to the New York State Engineer and Surveyor. In 1925, he was appointed District Engineer at Buffalo, New York. As District Engineer, he inaugurated research projects that notably improved the concrete pavements in western New York. He established unique methods of testing steel, paints and protective coatings for highway signs, and is currently chairman of a state committee to study the type of signs to be installed on the New York State Thruway.

He has been active in the work of the Highway Research Board's Department of Traffic and Operations, the American Association of State Highway Officials, the Joint Committee for Uniform Traffic Control Devices, the National Society of Professional Engineers, the Institute of Traffic Engineers, and other engineering and technical groups. He was selected as "Professional Engineer of Achievement by the New York State Society of Professional Engineers, cited by the Erie County Chapter of Professional Engineers as a "Distinguished Engineer and Public Servant" and awarded the degree of Doctor of Engineering by Union College.

Waters was selected to receive the Roy W. Crum Award by the executive committee of the Highway Research Board, a nongovernmental agency organized under the National Academy of Sciences—National Research Council in Washington. The award was presented by R. H. Baldock, chairman of the Board's executive committee.

THE Ametron SPEED METER

takes the guessing out of catching the speeder on the highway. It tells at once the exact rate at which the driver is traveling. Takes only a few minutes to set up. Indicates the speed of vehicles directly on the meter face. Measures the time it takes a vehicle to pass between two road tubes spaced 11 feet apart. Front wheels of vehicle actuate a trigger circuit as they cross the first tube. When front wheels hit second tube timer stops and speed is read on instrument. Directional control allows measuring of speed in either direction.

So simple its maintenance cost is very low. So compact it is easily portable. Best of all—its low cost will surprise you.

Police officials who have tried it out are enthusiastic over its effectiveness.

Write for illustrated brochure

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Traffic Signal Inventor Retires

William L. Potts, (Assoc. Member, I.T.E.) inventor of the electric traffic signal, was honored for his 40 years of labor in the traffic engineering field upon his retirement January 15 from the post of Traffic Engineer for the Automobile Club of Michigan.

At a testimonial luncheon given by the Detroit Safety and Traffic Committee Detroit's Mayor Albert E. Cobo presented Billy Potts with an oil painting by artist John Coppin of a traffic signal in action.

The first three-color traffic signal was designed and built by Billy Potts in 1920 when he was with Detroit Police Department. This first signal was installed at the intersection of Woodward Avenue and Fort Street in downtown Detroit and is now on display at Greenfield Village.

William L. Potts

By 1924 traffic signals were being manufactured commercially and in 1928 a court battle raged between manufacturers as to the identity of the inventor. Finally, the United States District Court of Appeals in Chicago ruled that "Billy" Potts was the inventor. Ironically, Potts had been interested only in safe traffic movement and never obtained a patent on his invention.

Another first for Billy Potts was recorded when he installed the first two-way radio in a police car for the City of Detroit Police Department.

During the past 15 years as Traffic Engineer for the Automobile Club of Michigan Potts has conducted more than 60 traffic surveys of Michigan cities.

Not one to rest on his laurels Billy has shifted his interest to another field. While basking under Florida sunshine he will attempt to set a few firsts with his rod and reel.

HOLMES ACCEPTS NEW POSITION

(Continued from page 211)

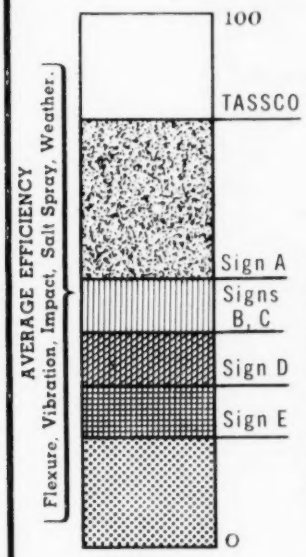
and other vital community services and industrial facilities.

Bob is a native of Tennessee and graduated from Georgia Institute of Technology in 1938. After specialized training the following year at the Yale Bureau of Highway Traffic, he was assigned to the Special Highway Division, Pennsylvania Turnpike Commission, and later joined the staff of the National Conservation Bureau in New York as Traffic Engineer.

For sixty-five months in World War II, he was engaged in research and development of traffic anfid automotive equipment for the Engineer Board at Fort Belvoir and later the training of Military Police at Fort Custer, Michigan. Toward the end of the war, he served on the General Staff in Washington as Deputy War Department Safety Director, responsible for the organization and administration of a worldwide Army motor vehicle safety program. He now holds a Reserve Commission in the Transportation Corps.

Since Bob's last personality sketch appeared in TRAFFIC ENGINEERING (April, 1951) he has added a girl to his family—Mary Jo—giving the latest Holmes register at two boys and a girl —8, 3, and 2 respectively.

the TASSCO story



"... Gentlemen: Tests for determination of durabiblity characteristics of 6 sets of test panels (signs produced by six different manufacturers) are now complete. It was desired to determine effects when subjected to flexing, resistance to vibration, ability to withstand impact, resistance to salt spray and weathering." *

THE RESULTS REPORTED WERE ANALYZED AND REDUCED TO GRAPHIC FORM. **The bar graph tells the Tassco story!**

Here's proof that Tassco All-Aluminum signs provide more strength, more resistance to deterioration, and more legibility for longer than five other leading makes! Tassco Signs, highly competitive in first cost, are obviously your municipality's finest investment for traffic, highway, road and street use.

Traffic and Safety officials are invited to write for the new Tassco catalog, and to use the Tassco advisory services without obligation.

*Excerpt from letter of report on tests conducted under the auspices of one of the nation's largest municipalities, under impartial laboratory conditions using standard testing equipment. Report is on file and may be seen on request.

The Sign of TASSCO Traffic Safety

TRAFFIC and STREET SIGN COMPANY

84 FOUNDRY STREET • NEWARK 5, N. J.

Our New Baby...
Budget Priced Striper for Industry...Small Cities and Towns
REFLECTO-LINER, Jr.
It's NEW!
It's the Reflecto-Liner, Jr. and it's the budget's best buy for 1954. Unbelievably low priced, this mighty mite will give you big-machine striping performance on every job. From its mono-unit frame to the ample 9.3 cu. ft. compressor, this machine is a splendid example of Wald's carefully researched engineering. Maximum efficiency for applying either plain or reflective traffic paints is assured with the powerful 4 cycle, 2.5 horse-power engine and large 5 gallon paint supply tank. The vertical, horizontal and radial adjustments on this easily maneuvered machine offer extreme versatility and permits laying of 2"-4" lines right up to the curb.
Designed especially for Factories, Parking Lots, Airports, Small Cities and Towns, County and Township roads, the Reflecto-Liner, Jr. will do a man's sized job and can be purchased at a "petty cash" price.
Write, Wire or Phone Today for Bulletin 509.
WALD INDUSTRIES, Inc.
HUNTINGDON, PA.

Reference Notes

PEDESTRIAN PROTECTION SIGNS

By George W. Howie (Mem., ITE)
City Traffic Engineer
Cincinnati, Ohio

FIVE-SIDED "pedestrian protection" signs have been in experimental use in Cincinnati for the past three years, apparently with helpful effect. They have contributed to an awakening of interest in the problems of pedestrian safety in that city.

The pentagon-shaped signs read "School," "School Crossing 200 Feet" (or other applicable distance), "Play Ground," "Cross Walk," "Cross Walk 200 Feet," and "Pedestrians in Roadway." The design has been presented for consideration by the Joint Committee on Uniform Traffic Control Devices.

The "School" signs are used to provide advance warning of school zones, and are supplemented by standard speed signs at school boundaries. The advance "School Crossing" signs are used ahead of crossings where school patrols or adult school crossing guards are posted. "Play Ground" signs give advance warning similar to the "School" signs.

"Cross Walk" signs generally are double-faced signs, and are coated with yellow flat-top reflective sheeting. They are hung on span wires directly over or in close proximity to painted crosswalks, particularly where such crosswalks are heavily used or in locations where the motorist may not anticipate the pedestrian hazard. An experimental model of an internally illuminated crosswalk sign, using a standard two-faced 30"x30" unit with the pentagon-shaped sign silhoutted on yellow plexiglass, also is in use.

The "Pedestrians in Roadway" sign is used to provide warning on streets without curbs or sidewalks where the motorist may unexpectedly come upon pedestrians walking on the roadway, particularly at night and where sight distance is poor due to horizontal or vertical curvature, overhanging trees or shubbery, etc.

(Continued on page 223)

HARRY E. NEAL

Past President Harry Elwood Neal, Chief Engineer of the Division of Traffic and Safety of the Ohio Department of Highways died suddenly from a heart attack on February 15, 1954. Although not in the best of health in late years his unexpected death was a shock to his host of friends. Born 70 years ago in Lancaster, Ohio he had remained single all his life. He is survived by his mother and a sister, Miss Muriel K. Neal.

He received his engineering education at Ohio State University. He also held a degree in law. Following his graduation he was employed by one of the state's largest public utility companies where he remained until he joined the Ohio Highway Department shortly after the first World War. It was about this time that many states recognized the need of developing a coordinated system of highways for which the prime requisite was a method of designation and marking the established state highways by which the constantly growing number of motorists could find their way around the state.

Thus in 1921 Mr. Neal was appointed to organize and head a new Traffic Bureau for the purpose of developing a suitable system and the means of properly marking the highways of Ohio. This was accomplished by numbering the highways and designing the complementary symbols, markers, and directional signs which were necessary. Warning and informational signs came somewhat later, to be followed by adoption of Mr. Neal's plan of painting a center line along each State Highway. The latter required the development of machines to apply the paint and here again he pioneered, first with simple hand machines capable of two or three miles a day, later with truck mounted machines capable of ten to fifteen miles an hour. Probably no other traffic control measure has ever met with such universal approval as did the state highway pavement marking program.

The soundness of Mr. Neal's pioneer efforts were first recognized outside of Ohio by the inclusion of many of his designs in the original predecessor of the present day "Manual on Uniform Traffic Control Devices" in the roaring twenties. He had consistently remained in the forefront of leadership in matters relating to traffic control devices—especially signs and pavement marking. When Ohio's "Manual on Uniform Traffic Control Devices" printed in color first appeared in the early 1940s it was immediately accepted all over the nation as a model and was widely relied on and imitated. Indeed, it served as a guide from which much of material was incorporated into the last national Manual published in 1948.

The infant Traffic Bureau of 1921 grew into the Division of Traffic and Safety of the Ohio Highway Department by 1924 with Mr. Neal remaining the Division's first and only Chief Engineer until his death. The Division handles all matters pertaining to traffic control and safety on the state highways of Ohio. It also cooperates with and assists municipalities in local traffic studies. Besides the production of the fine state Manual

LONGER RANGE—TARGET VALUE
FOR YOUR HIGHWAY TRAFFIC SIGNS WITH
GROTELITE REFLEX REFLECTIVE SHEETING

Grotelite
REFLECTIVE SHEETING

SMOOTH
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SURFACE

COMPLETE LINE OF EMBOSSED METAL TRAFFIC SIGNS, REFLECTORS AND STREET NAME PLATES

This highly reflective, smooth surface reflex reflective sheeting makes a smashing, attention-compelling sign with longer range target value and full range legibility. Easily read night or day. The smooth, durable, self-cleaning surface can be screened, sprayed or brushed. It is easy to apply and makes the best long life, economical signs and markers. Available in sheets and completed signs.

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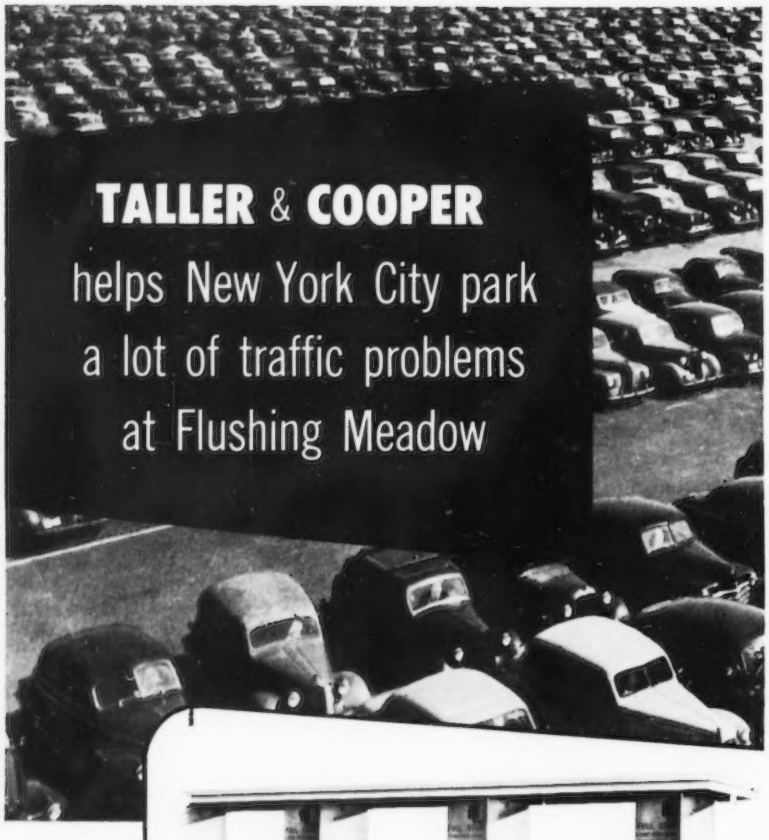
GROSE SQUARE - BELLEVUE, KY.
(Established 1901)



The vast Flushing Meadow Parking Lot in Queens, New York, gets efficient, safe toll collection with Taller & Cooper prefabricated Booths.

Taller & Cooper prefabricated booths are playing an increasingly important role in America's plans to relieve her growing parking problems. At Flushing Meadow, and many other parking areas, throughout the country, Taller & Cooper self-contained booths are being used to assure the greatest collection speed and revenue protection.

The all steel construction of Taller & Cooper booths offers years of maintenance free operation, provides safe, comfortable working conditions. Prefrabricated in the factory, they can be erected on your site in a matter of hours.

If you are planning a parking area, plant entrance, park, or any facility requiring a guard or collector . . . let TALLER & COOPER help you achieve the finest in efficient & economical prefabricated booths.

WRITE TODAY for design and construction details.

TOLL BOOTHS
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TOLL
COLLECTION
SYSTEMS

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ENGINEERS • MANUFACTURERS

66 WASHINGTON STREET • BROOKLYN 1, N. Y.

TALLER & COOPER TOLL COLLECTION EQUIPMENT
IS USED ON EVERY MAJOR TOLL FACILITY IN THE U. S.

other noteworthy accomplishments include the establishment of a sign shop with efficient methods for maximum economy in sign production, and the development of a specially equipped motorized pavement marking striper which has been widely copied. The sign shop of Ohio's Division of Traffic and Safety is one of the largest state operated plants in the nation and is a model of its kind.

One of the functions of the Division of Traffic and Safety is the direction of the program of state-wide traffic safety activities. Mr. Neal was a member of the Governor's Traffic Safety Coordinating Committee of State Officials and was Executive Secretary of the Ohio Traffic Safety Council, the citizens supporting group.

Mr. Neal's long leadership in his chosen profession kept him a very active and contributing member of many national and state committees. Among these were Chairman of the Subcommittee on Signs of the Joint Committee on Uniform Traffic Control Devices of which he was a member from its inception; National Committee on Uniform Laws and Ordinances; AASHO representative on the Highway Traffic Standards Committee of the American Standards Association; Vice Chairman of the Traffic Section of the National Safety Council; and he was a member of the ITE Handbook Committee which prepared the last edition of the Traffic Engineering Handbook published in 1950. He was a welcome and much sought speaker on traffic matters at conferences and universities throughout the country.

He was elected to membership in the Institute of Traffic Engineers in 1940. He served as Director 1944-46; Vice President 1947-50; and President 1950-51. He was a Registered Professional Engineer, and in addition to being a member of the Institute he was a member of the National Society of Professional Engineers, the Ohio Society of Professional Engineers and Phi Delta Theta Fraternity.

The Columbus morning paper editorily took notice of Mr. Neal's career in the following words (in part):

The man who pioneered traffic safety in Ohio is dead. But every accredited road in the state carries and will continue to carry reminders that he lived and worked to develop safety on Ohio's network of highways and roads.

Harry Elwood Neal also had the distinction of being the first person in the

you get LOW-COST, ONE MAN OPERATION with a JAWCO LIGHTWEIGHT TRAFFIC LINER!

The JAWCO Lightweight Traffic Liner, with 5 gallon capacity, combines ease of operation with low initial, maintenance and upkeep costs.

One inexperienced man can easily give you smooth, even, straight traffic and zoning lines with a JAWCO Lightweight Traffic Liner.

Inquire today! For further information, delivery date and price, write —

WEAVER MACHINE COMPANY

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United States to be appointed as a traffic engineer for either a city or a state. His appointment as state traffic and safety engineer was made in the early 1920's. He held the post until his death Monday.

Rapid development of vehicular traffic, following the end of World War I, pointed up the necessity of the state beginning to cope with a problem that has not yet reached its maximum. Traffic grew and Mr. Neal grew with it, developing new plans for controlling it and for making it safer.

He enjoyed a national reputation as a pioneer and leader in the development of traffic engineering and safety.

Although he held a law degree as well as one in civil engineering, Mr. Neal never practiced law. He devoted most of his adult life to traffic safety work. The markings on Ohio's highways will long stand as a memorial to him.

SECRETARY'S COLUMN

An important meeting of the National Committee on Uniform Traffic Laws and Ordinances was held in Washington February 15 prior to the opening of the White House Conference on Highway Safety. A scheduled meeting of the Executive Committee had to be cancelled because of certain last minute conflicts with the White House Conference arrangements which developed.

Your Secretary was privileged to attend the main Committee meeting through rather unusual circumstances. The Institute is not officially represented on the main Committee although it is asked to nominate three practicing city traffic engineers and alternates for Committee membership. However, the Institute does hold one seat on the Executive Committee with Fred Hurd as the Representative and the writer as Alternate. On the other hand the Yale Bureau of Highway Traffic is not represented on the Executive Committee but holds a seat on the main Committee, with Wilbur Smith and Fred Hurd as Representative and Alternate, respectively. As class schedules prevented both Wilbur and Fred from attending I sat on the main Committee as proxy.

The meeting dealt with the reports and recommendation of five subcommittees and considered several other matters for future action. It was far from being a "rubber stamp" session. About half of the proposals were sent back to

(Continued on page 222)

SECTION NEWS

Canadian Section

The first meeting of the Canadian Section of the Institute of Traffic Engineers was held at the Hotel Statler, Buffalo, N. Y. on Wednesday, September 30, 1953. Attending this meeting were 8 members of the Institute as well as 7 additional interested parties. It should be noted that several of the non-members will be members in the near future.

Members:

G. A. Bacchus, Toronto,
R. W. Borrowman, Winnipeg,
H. F. Burns, Winnipeg,
H. R. Burton, Toronto,
Philippe Ewart, Montreal,
Adrien Genest, Montreal,
W. F. Irvin, Toronto,
W. Q. Macnee, Toronto

Non-Members:

W. Biddell, Toronto,
R. B. Campbell, Toronto,
W. J. Fulton, Toronto,
J. Halliwell, Kitchener,
A. Lomax, Hamilton,
B. W. Morrison, Hamilton,
K. H. Siddall, Toronto

The meeting was presided over by Philippe Ewart who acted as chairman.

Business

1. Election of officers:

The following slate of officers was unanimously elected by the members present.

President—Philippe Ewart,
Vice-President—Bob Burton,
Secretary-Treasurer—Walter Macnee

2. Sectional Meetings:

An attempt is to be made to arrange sectional meetings. It was appreciated that the distance obstacle would be great, but if the meetings were held in conjunction with such national meetings as the Canadian Good Roads Association this obstacle might be overcome.

3. Publicity:

It was suggested that the interests of the section would be advanced by informing such organizations as the Canadian Good Roads Association and the Ontario Traffic Safety Conference, that the section did, in fact, exist, and further that its members were available for such committees as could utilize the knowledge and experience of traffic engineers.

Reported by,

Walter Q. Macnee,
Secretary-Treasurer

Shopping Center

For detailed information and prices at no obligation to you, write directly to the manufacturers or check the desired numbers and mail to: Shopping Center, TRAFFIC ENGINEERING, Strathcona Hall, New Haven 11, Conn.

Rip — Snip — Clip — Rip — Snip — Clip — Rip — Rip — Snip — Clip — Rip — Snip — Clip — Rip

39 40 41 42 43 44 45 46 47

Name _____ Title _____

Address _____

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39.

Guide The Motorist . . . Don't Confuse Him

That is what the TRAFFICONE system of traffic control does for safety minded traffic engineers. Consider several of the many facts about TRAFFICONES: two sizes—the 28" Barricade or the 18" Channel. Colors of red, yellow and black. Lightweight and portable. Reflectorized for safe, dependable night operation. If safety is your problem, guide the motorist . . . don't confuse him. Write for complete information on how to increase the effectiveness of your traffic controls. Our colorful 36-page manual can help you.

INTERSTATE RUBBER PRODUCTS CORPORATION
908 AVILA STREET
LOS ANGELES, CALIFORNIA

40.

The Story Behind Hapco

For some time professional engineers as well as the general public have been aware of the extraordinary increase of Aluminum Alloys for structural and architectural applications. These uses have been made possible by the advances made in the alloying of Aluminum so as to achieve maximum corrosion resistance, together with heat-treatability, which in turn produces strengths far in excess of the pure metal. If you are in need of street lighting advice, write for modern HAPCO information on our expanded line of Street Lighting Poles.

HUBBARD ALUMINUM PRODUCTS COMPANY
6301 BUTLER STREET
PITTSBURGH 1, PENNA.

41.

Denver Plastics Has New Highway Post Bracket

Newest product under development is DENVER PLASTICS' bracket for highway posts which allows the post to be sheared off in the event of an impact by a vehicle and very easily re-erected with a minimum cost and with practically no damage to the post or sign. Write for full information on our complete line of plastic signs:

DENVER PLASTICS, INC.
15200 W. COLFAX
GOLDEN, COLORADO

42.

Flexibility and Thrift In Dual Meters

Growing parking problems are making more and more cities thankul that they have Dual Parking Meters. These flexible automatic meters are convertible to numerous single coin and multiple nickel, penny combinations by a single adjustment on the street . . . without extra expense or change of a single part.

Whether it's the popular Dual single head or the new Dubl Dual . . . you're getting the highest quality and efficiency built into any parking meter today. Remember, *you can't get Dual quality at a lower price!* Write today for bulletin DU-521 for on-street parking; Bulletin DU-522 for off-street parking.

THE DUAL PARKING METER CO.
CANTON 2, OHIO

43.

Ferro Porcelain Enamel Embossed Signs Are Permanent

For clearer, more visible and more permanent traffic directions—at no greater cost than less practical, less permanent means—specify FERRO Embossed Porcelain Enamel Signs. The signs that do not fade, chalk, or peel. They will be as easily read in years to come as on the day of their installation. Write for full information:

FERRO ENAMELING COMPANY
1100 57th AVE.
OAKLAND 21, CALIF.

44.

Porta-Flash Will Protect Your Child

The AMERICAN SAFETY SIGNAL CORPORATION can help you protect your school children. Recommended usage is one unit about 75 feet on each side of the regular school crosswalk — the twin flashing caution lights will thereby create a Slow Zone between the units and your children cross the street in comparative safety. To protect school crossings write for details to:

THE AMERICAN SAFETY SIGNAL CORP.
330 S. MAIN ST.
ELKHART, INDIANA

45.

The International Traffic Paint Is Zonemark

Zonemark has been used or over 25 years on the streets of hundreds of cities throughout the world. It is also extensively used in industry. Wherever marking lines are needed, Zonemark has set unsurpassed standards for quality, performance and economy. For a traffic paint with all advantages, write to:

HANLINE BROS.
BALTIMORE 30, MARYLAND

46.

Can You Compare The Before and After?

Be sure you get all the benefits of mercury vapor lamp illumination by using JEFFERSON Transformers for the efficient operation of mercury vapor lamps. Because of greater efficiency, more lumens of output per watt, Mercury Vapor Lamps are rapidly replacing other types of lighting for indoor and outdoor locations. JEFFERSON Transformers are available for all types of Mercury Vapor Lamp installations and are specifically designed to meet the requirements of leading lamp manufacturers. If you want the most benefit from your lighting system, write for details to:

JEFFERSON ELECTRIC COMPANY
BELLWOOD, ILLINOIS

47.

New Vitralume Signs Brochure Issued

PORCELAIN ENAMEL FINISHERS of Chicago announce their new 2-color sign brochure. The cover has a phantom effect showing 33 illustrations of signs of all types. The body illustrates many 2 and 3-color industrial type signs used for product identification. The brochure also illustrates the high temperature furnace which PORCELAIN ENAMEL FINISHERS uses to produce its line of Vitralume signs, and provides some information about the Company itself. Write for your copy to:

PORCELAIN ENAMEL FINISHERS
3221 W. 30th ST.
CHICAGO, ILLINOIS

. . . that's one reason why MI-CO Parking Meters are such high producers. The elimination of complex mechanism, and the easy accessibility of parts make servicing MI-COs a comparatively simple procedure.

Records prove that MI-COs seldom require attention, but whenever one does need adjusting, quick servicing features usually make it possible to do the work right at the meter location. Thus in a matter of minutes the meter is back on the job, serving motorists and producing for the city.

Parking meters are a must for efficient traffic control. But unless they can be depended upon to operate efficiently and continuously during parking hours, they may do more harm than good. For example: every "Out of Order" meter reduces by one the number of cars which may be accommodated. Furthermore, the cost of keeping undependable meters in repair lessens considerably the revenue potential.

It pays therefore to consider carefully the advantages of one meter over another; to check the performance, maintenance and earnings records of all makes of meters. These reports are available, and it may surprise you to find that there is a vast difference in figures for various makes of meters.

Both types of MI-CO Parking Meters have excellent records for low-cost upkeep as well as consistently high earnings. And their record for long productive life should not be overlooked, because it's the five- to ten-year stretch that proves the worth of a parking meter.

We'll be glad to submit facts and figures which prove the reliability of the well-known manually operated MI-CO, and the original time-tested MI-CO Twin Automatic. Before you decide to buy any meters, it will be to your advantage to talk it over with MI-CO.

MICHAELS PRODUCTS:

Store Fronts
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Lamp Standards
Marquees
Tablets and Signs
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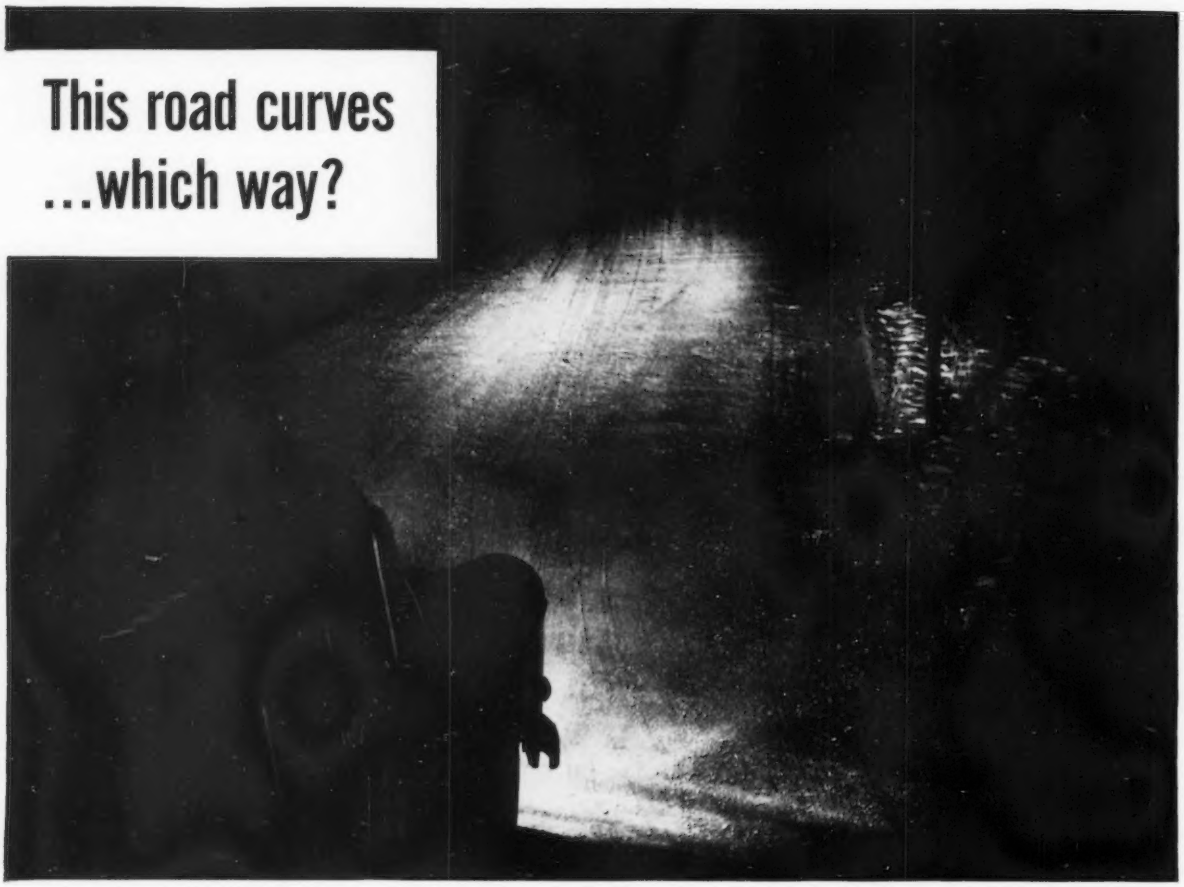
Astragals
Railings
Grilles and Wickets
Kick and Push Plates
Push Bars
Thresholds
MI-CO Parking Meters
Museum Trophy Cases
Bronze and Aluminum Doors
Bank Screens and Partitions

MI-CO METERS, 241 Court St., Covington, Kentucky

Division of The Michaels Art Bronze Co., Inc.

This road curves ...which way?



Stimsonite delineators (200 feet apart, closer on curves) clearly define a dangerous stretch of highway.

Left—but it's hard to tell from the driver's seat. With Stimsonite delineators (small photo) road alignment and grade are clearly indicated ... the "horizon" that guides the driver by day artificially restored by night.

Leading traffic authorities have indicated that delineation reduces night driving hazards as much as 25%!

Stimsonite is by far the most practical reflective material for delineation. Only Stimsonite reflects light accurately enough and far enough—from small areas—to insure adequate protection. That's because only Stimsonite is made up of accurately molded cube corners that reflect light *directly back toward its source.*

And . . . Stimsonite reflectors are all one material. Reflecting surfaces are molded inside—and sealed. There is nothing to chip, fade or wear off. Exposed surfaces are smooth and curved to shed road film in the rain. **WRITE FOR DETAILS.**

STIMSONITE® *for* ***Seeability Readability Durability***

AGA DIVISION

ELASTIC STOP NUT CORPORATION OF AMERICA

1027 NEWARK AVENUE, ELIZABETH 3, NEW JERSEY

Strictly Business

This new portion of the magazine is devoted to keeping our members informed of product news and developments.—EDITOR.

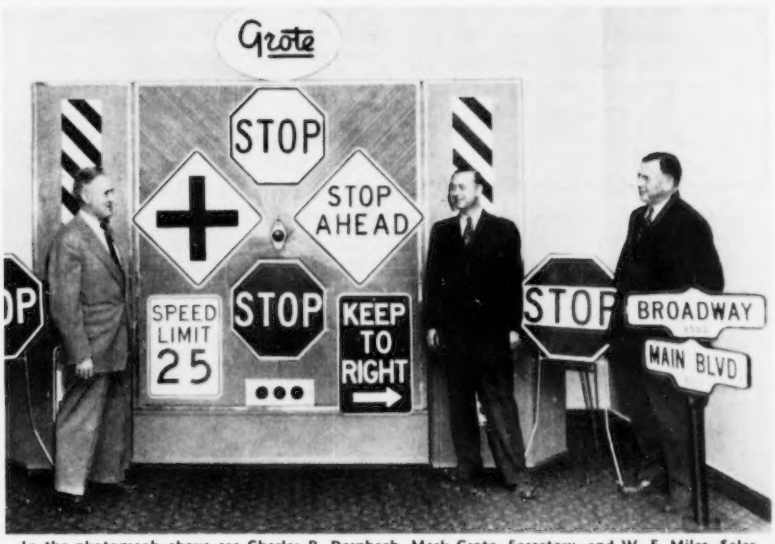
New "WALK" and "DON'T WALK" signals at street intersection — Jersey City approach to Holland Tunnel.

New "Walk", "Don't Walk" Signals Installed

The Port of New York Authority recently put into operation Crouse-Hinds "WALK" and "DON'T WALK" street signals to control the movement of pedestrians at seven street intersections at the Jersey City approaches to the Holland Tunnel. The signals are designed to assure the safety of pedestrians, including two thousand children attending three schools in the neighborhood.

The pedestrian signals are timed to work in conjunction with the vehicular traffic signals. The "WALK" signal is green while the "DON'T WALK" signal is red.

Preparatory to the operation of the pedestrian signals, Lieutenant Thomas Finnie of the Jersey City Police and Lieutenant Theodore Garretson of the Port Authority Police visited the schools in the vicinity of the Tunnel, and, using a sample signal, explained the operation to the children. In addition, as an aid in pedestrian understanding of the signals, the Port Authority will distribute written instructions to people in the Holland Tunnel approach area.



In the photograph above are Charles R. Dernbach, Mark Grote, Secretary, and W. E. Miles, Sales Manager of Grote's Reflective Sheeting and Sign Division. This was one of the displays provided in the rooms of manufacturers and sustaining organizations during the 24th Annual Meeting.

Sign Faces Mean Economy and Durability

"EZ-ON" Traffic Sign Faces are designed and made specially for fitting over defaced or damaged traffic signs right on location and without taking signs out of service. These "on the job" Faces are now being used extensively in the First District of the State of Kentucky. Comprising thirteen counties in the Western part of the State, these 30 gauge steel, reflectorized Faces have been installed by the Highway Department for actual testing under service conditions.

The proven acceptance of "EZ-ON" Traffic Sign Faces can be attributed to the fact that their cost is about one half that of a regular type sign, and because they are so readily installed on the job. This negates the unnecessary expense and effort of hauling signs to the shop and returning them to the location. This economy is accentuated, because most of Kentucky's highway signs are made by prison labor.

The manufacturer, The Grace Sign and Manufacturing Company of Saint Louis, Missouri produces these Faces in two styles—octagonal and triangular, and in two sizes—24 inch and 30 inch. Standard warning and regulatory messages, as well as special copy is available on all "EZ-ON" Faces. These economical and durable Faces are also being used in cities and county highway departments in several mid-western states.

New "Glow Striper" With Unique Features

A new low-priced centerline traffic lane marker, that handles both reflective and standard paints, and incorporates a unique rear steering device has just been announced by the Meili-Blumberg Corp. of New Holstein, Wisconsin. Known as the Model 6-18 it has an 18 gallon capacity and is powered by a 6 h.p. Wisconsin engine. It lays a single line, solid or intermittent, with or without reflective beading, at a rate of 3 to 5 miles per hour. The spray gun can be set for center line marking, or may be mounted on a frame outside of the wheels, either right or left, thus permitting close work up to safety islands, curbs, etc.

The unit is self-powered with a unique pivot arrangement of the rear wheel, enabling the machine to be easily steered in circles, figure 8's, straight lines or to conform to any desired marking job. The operator rides on the

built-in trailer platform with all controls conveniently within reach, and complete visibility for operating and steering.

Additional features include a paint strainer in the circuit; air actuated gun; positive acting paddle type paint agitator; cleaner tank; fast acting control valve and an 18 gallon A.S.M.E. approved safety tank.

New Speedmeter

Streeter-Amet Company announced a new speed meter that will be welcomed by all officials who are trying to cut down the mounting toll of death and injuries on our streets and highways.

The Ametron Speed Meter is a popular priced instrument that any city or county can afford to buy. It is simple in construction, takes only a few minutes to set up and is economical to maintain. It is so compact it can be carried in a single carrying case.

The Ametron Speed Meter is a portable road tube operated speed measuring instrument. It is manually operated and indicates the speed of vehicles, in mph directly on the meter face. Its operation is based on measuring the time it takes a vehicle to pass between two road tubes spaced 11 feet apart. The front wheels of the vehicle actuate a trigger circuit as they cross the first tube starting a timer. When the front wheels hit the second tube, the timer stops and the speed is read directly on the instrument. Directional control is provided by a selector switch to allow the measuring of speed in either direction.

The timer consists of a calibrated discharge circuit in connection with a precision capacitor. The capacitor is charged to a set voltage. When the front axle crosses the first tube a control relay is actuated. This relay locks in and begins to discharge the capacitor. When the front axle crosses the second tube, a second relay is actuated which stops the discharge and allows the operator to read the remaining voltage, which is calibrated in mph. The unit is then reset by breaking the locking circuits with a reset switch.

Police officials who have tried it out, are enthusiastic over the Ametron Speed Meter. They predict a ready acceptance of this economical and efficient instrument throughout the nation.

An illustrated brochure may be had by writing to Streeter-Amet Company, 4101 Ravenswood Avenue, Chicago 13, Illinois.

SECRETARY'S COLUMN

(Continued from page 217)

the subcommittee for re-working in the light of the discussions which had ensued. Perhaps the most important action was adoption of the report of the subcommittee in Consolidation of the Uniform Code, which recommended combining the five separate acts into one single volume. The Subcommittee's study turned up a number of inconsistencies and conflicts which will be eliminated as will much of the duplication that is now present.

Institute members seen at the meeting included: Dave Baldwin, Tom Boate, Bill Canning, Bill Elliot, Bill Groth, George Howie, Ed Johnston, Al Malo, Burt Mash, John Mitton, Burt Sexton and of course, Honorary Member Sidney Williams who is Chairman of the Committee. Other members I saw during my stay in Washington were: Bob Allen, Hank Evans, Mer Kraft, Ted Matson, Grant Mickle, Charlie Prisk and Bud Yost.

TIM TODD

Install KARPARK *meters*

FOR EFFICIENT TRAFFIC CONTROL

Wise administrators of municipalities, from large metropolitan cities to small towns, have found the answer to the complex problem of parking with the dependable KARPARK meter system. Both the KARPARK TWIN-O-MATIC and UNIMATIC meters have been engineered for efficiency of operation and true economy. Used independently or in combination, they'll fit the particular requirements of your own community.

Tick off these KARPARK features against your needs:

FLEXIBILITY

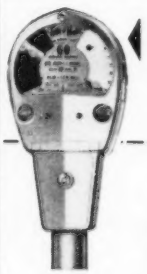
KARPARK meters can handle various coin combinations, depending on your requirements, and can be made to indicate violations at time intervals specified by you.

EFFICIENCY

KARPARK meters are superbly built by The Herschede Hall Clock Company, makers of America's finest clocks. They're simple to operate, and their high visibility makes enforcement easy. And they're ruggedly constructed to give accurate timing in all kinds of weather.

ECONOMY

KARPARK meters are economical because they provide substantial savings in maintenance, replacement, and law enforcement.



KARPARK TWIN-O-MATIC

Times two cars with one installation. Adjusts to any desired change in regulations. Reduces maintenance and collection costs to unheard-of lows. Ruggedly built for long life.

KARPARK UNIMATIC

For single car parking. Can be used for an entire system of single car parking, or, when used with Twin-O-Matic, can be placed at street ends and special single locations.

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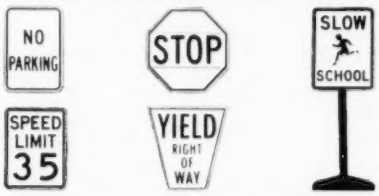

REGULATION TRAFFIC & WARNING SIGNS & POSTS
WITH OR WITHOUT REFLECTORIZED BACKGROUND

DETAILED SPECIFICATIONS, DESCRIPTIVE LITERATURE & PRICES OF SIGNS & POSTS ON REQUEST

MUNICIPAL STREET SIGN CO., INC.
773-7 MEEKER AVENUE • BROOKLYN 22, NEW YORK

PEDESTRIAN SIGNS

(Continued from page 214)

All signs in this pedestrian protection series are made with black lettering on a standard federal yellow background. In dimensions, they are 21″ on each side, with a spread of 34″ between opposite points. This approximates the area of a 30″ diamond-shaped sign.

The pedestrian protection series was adopted in recognition of the great lack of uniformity in signing for pedestrians, especially at school zones. This is particularly emphasized in a recent report on "National Practices for the Operation and Protection of School Zones and Crossings" presented by a subcommittee of the AASHO Committee on Traffic. A. R. Pepper, Traffic Engineer, Colorado State Highway Department, is chairman of that subcommittee.

Also considered in selection of a pedestrian protection sign series were the facts that motorists seem to consider the diamond-shaped sign as essentially a self-protection device and tend to disregard it if they discern no hazard to their own safety, and that the pedestrian protection problem remains the greatest unsolved problem of traffic safety in urban areas. It is hoped that adoption of a nationally uniform standard sign for pedestrian protection ultimately will sound a note of regard for the safety of one's fellow man, just as other standard signs register specific warnings or messages in the minds of alert motorists.

This seems to be the result of installation of the pentagon pedestrian protection signs in Cincinnati during the short span of their use. Most of the motorists using the city's streets now readily recognize the five-sided signs on sight with the message calling for special regard for a pedestrian hazard ahead.

TOLL ROADS

(Continued from page 205)

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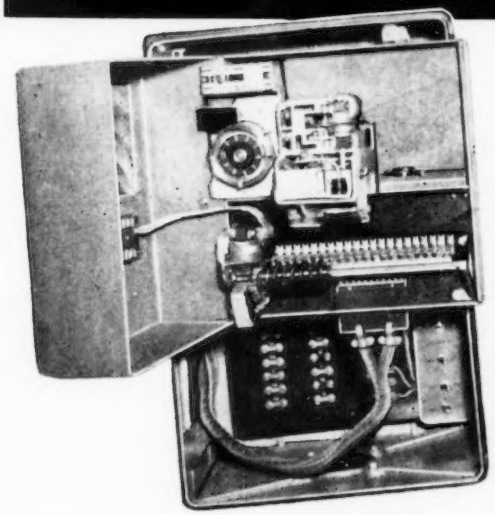
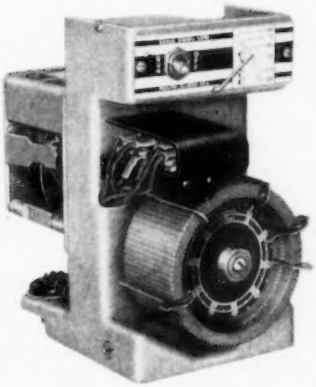
Ask for a demonstration . . . of the NEW ***Flexible*** **MULTI–DIAL**

EAGLE "EF20" TRAFFIC CONTROLLER

EASIEST TO MAINTAIN



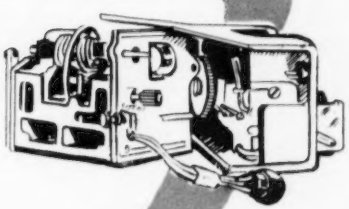


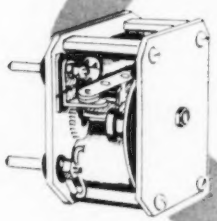
The new Eagle Multi-Dial controller has been designed with all parts accessible for ease of maintenance using only simple tools.

Cycle Unit

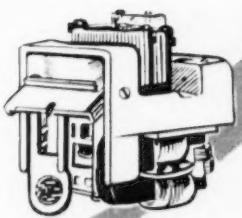
All wiring is color coded.

Motor is jack plug connected to cycle unit.





Separate unit flasher, with ball bearing, induction disc-type motor, is jack mounted.



Cycle unit electrically and mechanically jack mounted.

Eagle's outstanding features have been designed to meet all conditions required by traffic Engineers and maintenance men.

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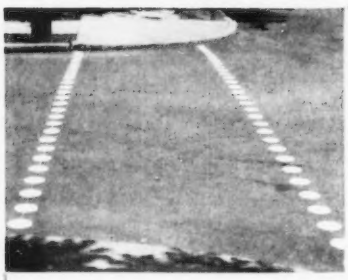

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